Yours Very Truly
Chas. F. Carney

Med
A

PROCEEDINGS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

AT THE

Twenty-fifth Annual Meeting,

HELD IN TORONTO, ONT., SEPTEMBER, 1877.

ALSO THE

CONSTITUTION, BY-LAWS, AND ROLL OF MEMBERS.

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REPORTER ON PROGRESS OF PHARMACY.

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PROPOSED AMENDMENT TO THE CONSTITUTION.

To be acted on at the Twenty-sixth Annual Meeting.

Proposed by Mr. Joseph P. Remington at the fifth session of the Twenty-fifth Meeting.

Strike out in third line of Article I the words "the United States," and insert in place thereof "America," so as to make the sentence read as follows:

"Its aim shall be to unite the educated and reputable Pharmaceutists and Druggists of *America* in the following objects."

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Nominated by the Treasurer and Permanent Secretary, and approved by the President, to carry out the resolution passed at the fifth session of the 18th Annual Meeting.

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LIST OF QUERIES

TO BE ANSWERED AT THE TWENTY-SIXTH ANNUAL MEETING, IN 1878, AT ATLANTA, GEORGIA.

Query 1. In view of the remedial properties accorded to Coca leaf—Erythroxylon Coca—what pharmaceutical preparation can be made, having its properties in the most desirable form?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

2. What is the therapeutic value of Dialyzed Iron as an antidote for Arsenious Acid as compared with the Hydrated Ferric Oxide?

Accepted by Adolph Tsheppe, New York.

3. Would the substitution of Citrate of Sodium for Citrate of Ammonium in the officinal Pyrophosphate of Iron make the latter less liable to become insoluble on keeping?

Accepted by G. F. H. Markoe, Boston, Mass.

4. What is the comparative therapeutic value of Ergot grown in the United States and Europe?

Referred to George Zellhoefer, New York.

5. The affinity of Glycerin for water is well known; to what extent will officinal Glycerin attract moisture on being exposed to a damp atmosphere?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

6. Ergot contains a large quantity of fixed oil which sometimes interferes with percolation, and which the British Pharmacopœia removes by ether. May Petroleum Benzin be used for the same purpose and without injuring the medicinal properties of Ergot? What quality of Benzin (spec. grav., boiling-point, etc.) is best adapted for the purpose, and may the fixed oil be used either in medicine or the arts?

Accepted by P. W. Bedford, New York.

7. Damiana. An essay in regard to its medicinal value and active constituents, including its history and botanical source.

Accepted by H. J. Menninger, Brooklyn, N. Y.

8. Are there any drugs now successfully cultivated here which were formerly obtained from foreign countries?

Accepted by H. S. Wellcome, New York.

9. Compound Resin Cerate alters in consistence upon keeping. How can this be prevented?

Accepted by S. A. D. Sheppard, Boston, Mass.

10. Confectioners frequently use deleterious substances for coloring candies. How can harmless colors, suitable for their use, be made?

Referred to S. P. Sharples, Boston, Mass.

11. Tinctures. Experiments and suggestions in regard to proportion of drug and strength of alcohol necessary for extraction and preservation.

Referred to Jacob Jesson, Chippewa Falls, Wis.

12. On the condition of the mercurial constituent in the several pulverulent preparations as recommended to be prepared with Sugar of Milk. (See Amer. Jour. Phar., 1876, p. 267.)

Accepted by P. W. Bedford, New York.

13. To what extent do the pills of the United States Pharmacopœia supply the demand for ready-made pills? Are there any formulas which, if introduced, would add to the value of the list?

Accepted by R. V. Mattison, Philadelphia, Pa.

14. How do the commercial Bismuth preparations compare with the requirements of the United States Pharmacopœia?

Accepted by Adolph Tsheppe, New York.

15. It is written of the berries of Benzoin odoriferum (Spice Bush Berry), that they yield nearly fifty (50) per cent. of fixed oil, besides about five (5) per cent. of agreeable volatile oil. Is this really so? The plant being very common in some parts of the United States, for what can its products be utilized?

Accepted by A. W. Miller, Philadelphia, Pa.

16. There is a counterirritant or revulsive plaster spread upon linen or cotton cloth purporting to be made in Paris, France, under the name of "Emplastrum Thapsiæ." As this has decided therapeutic value, what is its composition, and can it be advantageously prepared and kept for extemporaneous use?

Accepted by H. P. Tarrant, Augusta, Ga.

17. What advantage, if any, would result from the removal of fixed oil from Colchicum seed preparatory to the preparation of the fluid extract?

Accepted by E. L. Boerner, Iowa City, Ia.

18. Extractum Glycyrrhizæ fluidum. Should the alcoholic strength of the preparation be reduced, or what other changes are desirable in the formula to increase its adaptability for masking the taste of unpleasant medicines under varied circumstances?

Accepted by J. P. Remington, Philadelphia, Pa.

19. Can any improvement be suggested in the formula of the Pharmacopœia for fluid extract of Wild Cherry—keeping its object in view to represent chiefly the astringent and tonic virtues combined with as much hydrocyanic acid and volatile oil as may be obtained by percolation?

Accepted by J. T. Shinn and Israel J. Grahame, Philadelphia, Pa.

20. What is Oil of Cedar of commerce? Where and from what plant or plants is it made, and what is it used for?

Accepted by J. H. Stein, Reading, Pa.

21. Solvents for Wax, Paraffin, Stearin, Ceresin, as a test for adulteration of wax.

Accepted by P. W. Bedford, New York.

22. Galbanum is extensively adulterated. What are the adulterations?

Accepted by A. E. Ebert, Chicago, Ill.

23. Can Salicin be economically made in North America, and by what process?

Accepted by E. Gregory, Lindsay, Ont.

24. Can Grape-sugar or Glucose be substituted for Cane-sugar, Honey, and Glycerin, in pharmaceutical preparations? Give a practical essay on the subject.

Accepted by E. H. Sargent, Chicago, Ill.

25. An essay on the conditions necessary to successfully conduct percolation.

Accepted by J. U. Lloyd, Cincinnati, O.

26. How can the Salts of Berberina be most easily prepared from the root of Hydrastis Canadensis? What will be the practical yield, and what are the solubilities of the different salts?

Accepted by J. U. Lloyd, Cincinnati, O.

27. Resin of Podophyllum is found upon the market in color ranging from light-brown to deep-yellow. Can these various shades be obtained from Mayapple root without the use of foreign substances?

Accepted by J. U. Lloyd, Cincinnati, O.

28. How do Rio and East India Tapioca compare in dietetic value?

Accepted by William J. Jenks, Philadelphia, Pa.

29. Give a formula for a concentrated liquid preparation of Lactucarium, from which can be made the Syrup, Tincture, or other preparations.

Accepted by Joseph L. Lemberger, Lebanon, Pa.

30. Report on the brands of White Wax in the market.

Accepted by P. W. Bedford, New York.

31. The preservative properties of Boracic, Benzoic, and Salicylic Acids have lately attracted considerable attention. What are their respective values as preservatives, and which is best adapted to the uses of the pharmacist? If possible, give a ready method for their use.

Continued to S. P. Sharples, Boston.

32. The present officinal formula for the preparation of Fluid Extract of Ipecacuanha is both complicated and impracticable in its details, and unsatisfactory in its product. Should the formula of the Pharmacopœia of 1860 be retained in the next revision, or can a more perfect mode of preparation be devised?

Continued to J. Faris Moore, Baltimore.

33. A more perfect formula for the preparation of Fluid Extract of Wild Cherry is desired, representing both the astringent and sedative properties of the drug.

Continued to E. S. Wayne, Cincinnati.

34. What are the comparative values of Benzoin and Styrax for preserving ointments, etc., from rancidity and decomposition ?

Continued to I. J. Grahame, Philadelphia.

35. Much difficulty has been experienced of late years in procuring an article of litharge for the manufacture of Lead Plaster which will yield a perfectly white plaster. To what is this variation owing, and what is the most ready method of determining a satisfactory article of litharge?

Continued to E. S. Wayne, Cincinnati.

36. The quantity of Acetic Acid in the formula for the preparation of Acetic Extract of Colchicum (U. S. P., 1870) is directed to be four fluid ounces for twelve troy ounces of drug. Is not this quantity unnecessarily large, and cannot less be used without interfering with the stability of the preparation? Also, can the formula be altered in regard to its menstruum by using alcohol with any advantage?

Continued to I. J. Grahame, Philadelphia.

37. In view of the coming revision of the Pharmacopœia, a review of the present class of officinal fluid extracts is desired, in order that their defects may be remedied and more satisfactory formulas adopted. Also, more information regarding the standard of commercial fluid extracts, with their sophistications and general state of purity.

Continued to Charles L. Mitchell, Philadelphia.

38. When a syrup of Pyrophosphate of Iron is prepared by dissolving pyrophosphate of iron in simple syrup, after some time the preparation becomes much darker, and finally deposits a white scale. What is the cause of this? Is it a decomposition, and can it be remedied?

Continued to J. F. Judge, Cincinnati.

39. An essay on the use of citric acid and other preservative agents in syrup of iodide of iron.

Continued to P. W. Bedford, New York.

40. What is the nature of the free acid contained in fluid extract of taraxacum; is it augmented in quantity by age and exposure, and does a similar change take place in the root collected in accordance with the Pharmacopœia and kept with or without special precautions?

Continued to H. A. Vogelbach, Philadelphia.

41. In making resina podophylli (U. S. P.) the concentrated tincture is precipitated by acidulated water, for which some manufacturers substitute an aqueous solution of alum. What effect has the substitution of alum and other acid salts upon the physical and chemical properties of the product, and what is the medicinal value of the principles remaining dissolved in the aqueous solution?

Continued to B. F. McIntyre, New York.

42. Give working formulas for the various pharmaceutical preparations of cod-liver oil in use in the United States, and of such as may appear desirable from other countries.

Continued to J. Williams, Worcester, Mass.

43. Do certain medicinal plants lose their medicinal properties upon drying, and will it be better to tincture them while fresh?

Continued to J. U. Lloyd, Cincinnati.

44. Stylophorum diphyllum, Nutt., which grows abundantly in the Western States, is closely allied to Chelidonium majus. A chemical analysis is requested, with a view to comparing its composition with that of chelidonium.

Continued to O. Eberbach, Ann Arbor.

45. Guarana. Determine the best method for its extraction, so as to secure all the guarania with the least possible quantity or percentage strength of alcohol, and determine a rapid and pharmaceutically accurate method for the assay of the alkaloid in its various preparations and in the powder.

Continued to S. W. Cochran, Camden, N. J.

46. Grindelia robusta. Determine the best methods for making the various galenical preparations.

Continued to Charles L. Mitchell, Philadelphia.

47. When spiritus ætheris nitrosi is mixed with fluid extract of uva ursi it is stated that in some cases a certain decomposition ensues, while in others no change is noted. What is the cause of the reaction?

Continued to J. L. A. Creuse, New York.

48. An examination into the methods of distinguishing the alkaloids of cinchona bark from each other.

Continued to S. P. Sharples, Boston.

49. What other alkaloids, if any, are similar to or identical with atropia?

Continued to H. D. Garrison, Chicago.

50. The French filtering-paper that is imported at the present time contains an appreciable amount of soluble and a large amount of coloring-matter. What substitute can be used, or what can be done to cause an improvement in its quality?

Continued to James S. Talbot, Boston.

51. Can any of the decoctions or infusions of the U. S. P. be satisfactorily prepared from the fluid extracts of the U. S. P., and in what particulars do they differ from infusions and decoctions prepared in the prescribed manner?

Continued to John Henry Hancock, New York.

52. What chemicals may be profitably made by the retail pharmacists, and what apparatus is required for their preparation?

Continued to James R. Mercein, Jersey City.

53. The resin of Leptandra Virginica (the leptandrin of commerce) varies much in appearance and sensible properties. To what causes are these varying results to be attributed? What is the best process for the preparation of the resin, and what is the average yield from the root?

Continued to H. G. Keasby, Philadelphia.

54. How far are the so-called resinoids of commerce prepared according to the prescribed formulas, and can better processes be devised for the preparation of some of the more important of them?

Continued to W. J. M. Gordon, Cincinnati.

55. An essay on Gelsemium sempervirens, embracing the question as to what principle its activity is due, and whether the green root possesses any advantage over the dry.

Continued to W. H. Jones, Boston.

56. An essay suggestive and critical on the best plan of arranging and managing the store-rooms and cellar of a well-conducted dispensing store.

Continued to J. F. Hancock, Baltimore.

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PREFATORY NOTICE.

When the size of the present volume is compared with that of last year, members may have expected its issue at an earlier date. The undersigned regret that their appeals, frequently repeated in former years, to have all papers and reports ready at the annual meetings, and to furnish others, which have to be prepared afterwards, at the earliest date possible, that these appeals have again been indifferently responded to, whereby additional labor became necessary in order to have the volume published at this time.

As far as we have learned, the type selected last year has been generally regarded with favor, and was retained for this volume, thereby reducing considerably the number of pages without lessening its usefulness.

The excellent steel engraving of Charles Tibbetts Carney, published with this volume, represents one of our deceased members, who, though departed from this life fifteen years ago, and while he was in his thirty-first year, had nevertheless secured for himself the esteem and love of his fellow-members by his scientific attainments as well as by his amiability and uprightness. This tribute to his memory will doubtless be particularly gratifying to the older members of the Association, as a complement of the biographical sketch which was published in the Proceedings for 1863, page 24.

Many of the woodcuts which illustrate the various subjects in the present

volume have been kindly loaned by the publishers of "New Remedies" and of the "American Journal of Pharmacy."

We again desire to direct the attention of those members who have not yet

obtained the badge, adopted in 1876, that it may be obtained, nickel-plated, from the Secretary, at the price of fifty cents.

We also wish to again impress upon all members the desirability of complying, *if possible*, with the following requests:

1. That *all applications* be sent to one of the undersigned *at least* a week before the meeting.

2. That each application have the *full name* of the applicant, either printed or plainly written; and

3. In addition be accompanied by the *requisite funds*, unless the applicant expects to be present at the meeting.

4. That *all papers and reports* be presented ready to go to the printer.

5. That lists of *preparations exhibited* and *sketches of illustrations* needed for papers be handed to the Secretary separate from the papers.

6. That any *inaccuracy in the roll* and *changes of address* be communicated without delay to the Secretary; and

7. That the chairman of the Executive Committee be notified at the earliest opportunity of the *demise of members*.

We likewise desire to direct the attention of the members to the various reports and discussions upon the *financial* condition of the Association, and to urge a prompt response to the Treasurer's bills.

Attention is likewise requested for the suggestion of the Secretary (see page 497), that he be notified of the post-office addresses of the presidents and secretaries of *all pharmaceutical associations* usually represented by delegates at the annual meetings. It is contemplated hereafter to publish these in the Proceedings.

The prices of the Proceedings, now on hand, *including postage*, have been fixed as follows:

1851, 1852, 1853, 1854, 1855,	unbound,	$0	25	each.			
1857,	"		50	"	bound,	$0	80
1858, 1859,	"	1	50	"	"	1	75
1860,					"	1	25
1862, 1863,					"	1	50
1864, 1865, 1866,	"	1	50	"	"	1	80
1867,	"	2	20	"	"	2	50
1868, 1869, 1870,	"	2	50	"	"	3	00
1871,	"	4	50	"	"	5	00
1872,	"	2	50	"	"	3	00
1873, 1874,	"	5	00	"	"	5	50
1875, 1876,	"	7	00	"	"	7	50
1877,	"	6	00	"	"	6	50

There were no Proceedings published in 1861, and those for 1856 are entirely out of print.

The entire set of bound volumes, the first six in paper covers, will be furnished at $50, and the set of unbound volumes, including the bound ones for 1860, 1862, and 1863, at $45. To enable the members who have recently joined the Association to complete their sets, the committee offer the volumes for 1872 and all the preceding years, bound, at $20, and unbound at $18. These prices are *exclusive of postage or express charges.*

The Twenty-sixth Annual Meeting will be held in the city of Atlanta, Ga., on the first Tuesday (third day) of September, 1878, at three o'clock P.M. Delegations to that meeting are requested to make use of the blank forms of credentials, which may be obtained from the Secretary.

GEORGE W. KENNEDY,
Chairman of the Executive Committee, Pottsville, Pa.

JOHN M. MAISCH,
Permanent Secretary, 145 North Tenth Street, Philadelphia.

December 18th, 1877.

List of Members and Delegates

PRESENT AT THE TWENTY-FIFTH ANNUAL MEETING.

Baker, T. R., Richmond, Va.
Bayley, A. R., Cambridgeport, Mass.
Bedford, P. W., New York.
Belt, Z. J., Wilmington, Del.
Boyden, A., Boston, Mass.
Boyden, E. C., Boston, Mass.
Bullock, C., Philadelphia, Pa.
Burroughs, S. M., Medina, N. Y.
Calder, A. L., Providence, R. I.
Caldwell, J. W., Detroit, Mich.
Carter, S., Boston, Mass.
Casper, T. J., Springfield, O.
Cassebeer, H. A., Jr., New York.
Cook, T. P., Philadelphia, Pa.
Cutter, F. C., Brooklyn, N. Y.
Diehl, C. L., Louisville, Ky.
Dobbins, E. T., Philadelphia, Pa.
Duble, J. B., Williamsport, Pa.
Eareckson, E., Baltimore, Md.
Eberle, C. L., Philadelphia, Pa.
Eberts, A. E., Chicago, Ill.
Eimer, C., New York.
Elliot, W., Toronto, Can.
Estes, J. J., Rockland, Mass.
Evans, J. S., Westchester, Pa.
Folger, W. S., Boston, Mass.
Gardner, R. W., Bloomsfield, N. J.
Gates, C. E., Saratoga, N. Y.
Grahame, I. J., Philadelphia, Pa.
Gregory, E. Lindsay, Ont., Can.
Griffith, H. E., Niagara Falls, N. Y.
Hancock, C. W., Philadelphia, Pa.
Harvey, E., Toronto, Can.
Heinitsh, E. H., Columbia, S. C.
Henderson, J., Toronto, Can.
Heydenreich, E., Brooklyn, N. Y.
Hildreth, C. F., Suncook, N. H.
Hodgetts, G., Toronto, Can.
Hoffmann, F., New York.
Holzhauer, C., Newark, N. J.
Ingalls, J., Macon, Ga.
Jarrett, H. T., New York.
Jones, E. C., Philadelphia, Pa.
Jordan, F., Goodrich, Ont.
Kennedy, G. W., Pottsville, Pa.
Knowles, H. A., Toronto, Can.
Lander, J. C., Toronto, Can.
Lane, A. S., Rochester, N. Y.
Love, N. C., Toronto, Can.
McIntyre, E., New York.
McIntyre, N., Philadelphia, Pa.
Main, T. F., New Britain, Conn.
Maisch, J. M., Philadelphia, Pa.
Markoe, G. F. H., Boston, Mass.
Masi, Fred. H., Norfolk, Va.
Massey, G., Toronto, Can.
Mattison, R. V., Philadelphia, Pa.
Menard, A. A., Macon, Ga.
Menninger, H. J., Brooklyn, N. Y.
Milburn, J. A., Washington City.
Millener, W. S., Spencerport, Pa.
Miller, A. W., Philadelphia, Pa.
Miller, Hugh, Toronto, Can.
Miller, J. A., Harrisburg, Pa.

Mortimer, W. G., New York.
Munson, L. J., Waterbury, Conn.
Neergaard, W., New York.
Nichols, E. P., Newark, N. J.
Orne, C. P., Cambridgeport, Mass.
Peixotto, M. L. M., New York.
Pennington, T. H.S.,Saratoga Springs, N. Y.
Petrie, A. B., Guelph, Ont.
Pile, W. H., Philadelphia, Pa.
Plaisted, James H., Waterville, Me.
Rapelye, C. A., Hartford, Conn.
Reichardt, F. A., New York.
Remington, J. P., Philadelphia, Pa.
Rice, Charles, New York.
Robinson, W. S., Yorkville, Ont.
Robbins, A., Philadelphia, Pa.
Robbins, C. A., New York.
Rogers, W. H., Middletown, N. Y.
Ronnefeld, Theo., Detroit, Mich.
Rose, H. J., Toronto, Can.
Saunders, W., London, Ont., Can.
Sayre, E. A., Brooklyn.
Schaffle, S. W. W., Lewisburg, Pa.
Shaw, L., Philadelphia, Pa.
Shaw, R. J., Plainfield, N. J.
Sheppard, S. A. D., Boston, Mass.
Shinn, J. T., Philadelphia, Pa.
Shuttleworth, E. B., Toronto, Can.
Simson, F. C., Boston, Mass.
Squibb, E. R., Brooklyn, N. Y.
Stein, J. H., Reading, Pa.
Tarrant, H. P., Augusta, Ga.
Tscheppe, A., New York.
Tufts, C. A., Dover, N. H.
Vandervoort, R. W., Newark, N. J.
Waugh, G. J., Stratford, Ont., Can.
Weidemann, C. A., Philadelphia, Pa.
Wellcome, H. S., New York.
Wells, R., New Haven, Conn.
Whiting, F. T., Great Barrington, Mass.
Williams, J. K., Hartford, Conn.
Winter, Jonas, Hagerstown, Md.
Wood, A. F., New Haven, Conn.
Woodruff, R. S., Waterbury, Conn.
Zeilin, J. H., Philadelphia, Pa.

PROCEEDINGS

OF THE

TWENTY-FIFTH ANNUAL MEETING

OF THE

American Pharmaceutical Association.

REPORT ON THE PROGRESS OF PHARMACY,

FROM JULY 1, 1876, TO JUNE 30, 1877.

BY C. LEWIS DIEHL.

The scientific accumulations since the date of my last report have been fully as large as in previous years, and it has been my aim to embody them as completely as possible in this, in so far as they are of direct importance to pharmacy, and within the scope and intention of a report on pharmaceutic progress. The aim of your reporter has been, as it has been heretofore, to furnish as condensed accounts as possible of new facts and observations, without curtailing the extracts to such an extent as to render reference to the original papers necessary under ordinary circumstances. Indeed, the "Report on the Progress of Pharmacy" should be regarded—and should be in fact—an annual supplement to the pharmacist's library of "standard works," keeping him advised of the changes and scientific progress that are made from period to period, obviating the necessity for more expensive works of reference. But while this is what the report should be, it is by no means claimed that it completely meets the requirement. It must be recollected that the work upon the report can only be done at odd times in connection with the daily and active duties of a pharma-

cist, and that, therefore, the extracts are not as complete as might be desired, and lack the polish which a thorough digestion of the subject-matter would give. For the same reasons, also, it is not possible, except in isolated instances, to make the extracts more intelligible by commentary remarks, or to subject the same to appropriate criticisms, and the reporter would therefore remind that he is in no way responsible for inaccuracies or misstatements, except in so far as he may have inaccurately reported from the original credited in his report.

The introductory remarks to last year's report were intended to give a short review of all the facts embraced by it. The utility of such an extensive review has since occurred to me to be questionable, and I will therefore confine myself in this to drawing attention to a few subjects only which seem to deserve special mention, either because entirely new or because they throw further light upon prominent subjects hitherto embraced by the report. Among new remedies, attention has been prominently directed to "Xanthium spinosum"—a common weed, indigenous to Europe, but naturalized in the eastern sections of the United States—on account of its alleged prophylactic action in hydrophobia. The first notice of its reputed value seems to have been made as early as 1861, by Oesterle, who in turn received his information from Russian sources. No further attention seems to have been given it, however, until about a year ago Dr. Grzymala, of Podolia, again recommended it on the basis of observations extending over twenty years; the leaves being administered internally, and applied to the bites of rabid animals in the form of cataplasms. Physiological experiments made by Yvon have, however, given decidedly negative results, and its value is therefore by no means proved. But whatever may be its therapeutic value, the notoriety which the plant has achieved has elicited several interesting papers, Prof. Maisch giving a fine description of the plant, as well as of allied species, while Guichard and Godeffroy have engaged in the analysis. The experiments of Guichard seem to point to the presence of an alkaloid, which, however, he had failed to isolate at the date of his paper. In "Fucus vesiculosus," the common sea-wrack, we have an instance of an obsolete remedy restored to favor, it having been recently highly recommended for the purpose of reducing obesity. Formerly it was employed, in the form of charcoal and jelly, in scrofulous affections; it is now recommended in France in the form of extract and syrup, and Prof. Maisch suggests a formula

for a fluid extract. Prof. Dragendorff's paper on the active constituents of ergot, noticed in the last report, in which he had expressed a doubt as to the existence of Tanret's "ergotinia," believing it to be an admixture of sclererythrin with other substances, has elicited a rejoinder from Tanret, in which he claims that his ergotinia cannot contain the least trace of sclererythrin, and he shows, very plausibly, that Dragendorff's observations are based on error, in so far as they refer to his ergotinia. In connection with ergot it is of interest to mention the "corn smut" (Ustilago maidis), which during the past year has been repeatedly recommended for medicinal use. Dr. C. Henry Leonard has used it in the form of fluid extract in cases of labor, and contrasts it very favorably with ergot of rye. The root of "Megarrhiza Californica" has been subjected to chemical examination by J. P. Heaney, who finds it to contain, besides a peculiar (perhaps fatty) organic acid and a neutral fatty matter, two bodies, which he has named "megarrhizitin" and "megarrhizin." The latter is a bitter glucoside and apparently the active principle. By dilute acids it is split into glucose and "megarrhizioretin," which, as its name implies, is resinous in its character. The root has a reputation among the California Indians as a drastic purge, and it is used in domestic practice with good results as a laxative and cathartic.

Prof. Alfonso Herrera draws attention to a Mexican tree, "Thevetia yecotli," the Aztec name of which is "Ioyotli," the seeds of whose peculiar fruit are said to cure the bite of the rattlesnake, while the milky juice of the plant was used by the ancient Mexicans for curing deafness and cutaneous diseases. At present the seeds have a great reputation among the people for the cure of hæmorrhoids, being applied in form of ointment. They yielded to Prof. Herrera, besides an abundance of fixed oil, a well-developed crystalline glucoside, which he has named "thevetosin," and which appears to be a powerful poison, acting as an emetic, and paralyzing the respiratory organs, and, possibly, also the muscular system. Under the name of "Ava," or "Kave-kave," the root of "Piper methysticun" has lately attracted considerable attention in France as a remedy for gonorrhœa. Cuzent has subjected it to chemical examination and found essential oil, acrid resin, and a neutral crystalline principle—kavahin or methysticin—to neither of which the medicinal properties appear to be due, however. Since the publication of his paper on "Coto bark," which was extracted for the last report, Julius Jobst has had opportunity to repeat his ex-

periments with another parcel of coto bark. This, however, although undoubtedly genuine coto bark, showed marked differences not only in its exterior, but the principle corresponding to "cotoin" obtained from it differed markedly from this, and has, therefore, been named "paracotoin." It appears probable that, similar to cinchona bark, the coto barks may contain dissimilar principles. The author is engaged in further investigation to determine the relation between cotoin, paracotoin, and other crystalline constituents of coto bark. The source and nature of "jaborandi" continues to engage attention, although not to the same degree as during the two preceding years. E. Hardy has contributed another paper on this subject, in which he maintains that the variations in the physiological results obtained by different experimenters is attributable to the circumstance that they have not always experimented with true jaborandi, *i. e.*, the leaves of Pilocarpus pinnatus. The identity of the latter with the jaborandi of Dr. Continho he considers to be beyond dispute. Mr. Hardy's paper also embraces further investigation of the chemical components of the drug, and more particularly of the essential oil, which appears to be a complex body, composed of a hydrocarbon (pilocarpene) and several other bodies having a high boiling-point. M. H. Stiles has contributed an interesting paper on the microscopic structure on the stem of jaborandi (Pilocarpus species), while Prof. A. Gubler draws attention to a Piper (referable either to Piper citrifolium or Piper reticulatum), which is also called jaborandi in the province of Rio de Janeiro. He has determined that there is, besides the distinction of the plant, a very decided difference from Pilocarpus jaborandi in its physiological action. Hardy has found the plant to contain volatile oil and alkaloid, both of which, however, require further investigation. The latter author, in conjunction with N. Gallois, has isolated two distinct crystalline principles from the seeds of "Strophanthus hispidus," an apocynaceous plant used in tropical Africa as an arrow poison. It is there called "Inée." One of these principles, which was obtained from the seeds deprived of their hairs, possessed powerful tonic properties, while the other, obtained from the tufts of hairs covering the seed, appeared to be inert. Neither of them possess alkaloidal properties. Favorable reports on the cultivation of cinchonas in the East Indies have again been received during the past year. It may appear strange that acclimatization experiments should be necessary and have been proposed in Peru, the home of the cinchonas; but M. Marti-

net calls attention to the advantages that might result from an attempt to acclimatize in the Lima district the better kinds of Bolivian and Caratayan barks, giving the plants the same care in cultivation as the English give to those in their stations in the Himalayas, Ootacamund, etc. The observation that the root-bark of the cultivated cinchonas is very rich in alkaloids appears likely to revolutionize the method of harvesting cinchonas, which hitherto consisted in coppicing (*i. e.*, cutting the trees and leaving the roots to shoot). By this method a certain proportion of the roots fail to shoot, and there is a consequent loss. The operation of uprooting is found to be neither difficult nor expensive, while the increased yield of valuable bark more than repays the extra labor and expense of uprooting as well as replanting. The root-bark from one of the plantations yielded, according to Mr. Wood's analysis, eight per cent. of alkaloids, while the finest stem bark rarely yields more than seven per cent. From the fact that the bark of Cinchona succirubra, which flourishes best in India, while rich in total alkaloids, contains but little quinia, it has been suggested by the Government Quinologist to utilize this bark for the purpose of preparing a "Cinchona febrifuge," which shall take the place of quinia. The method of its production may be concisely stated to be the extraction of the ground bark by dilute muriatic acid, precipitation by caustic soda, resolution of the washed and dried precipitate, and reprecipitation for the purpose of purification. Large quantities of this febrifuge are being prepared in India, and physiological experiments made with it seem to prove its value as such, although it is liable to produce occasionally violent gastric disturbances.

In connection with the subject of cinchona, it is interesting to learn that the alkaloid "Aricina," obtained by Pelletier and Caviol from a cinchona bark from the port of Arica, and which was also obtained by Boerkoehn from a bark exported from Cusco, and was named by him "Cusconia," is, according to recent researches of O. Hesse, when perfectly pure, identical with "cinchonidia." The new alkaloid recently obtained by De Vrij from cinchona bark from Jamaica, as well as Mangini's "cinchovatina" (from C. ovata), are, according to the same authority, also identical with cinchonidia. A peculiar "blue fluorescent body" has been found by Richter to be a constant compound of Atropa belladonna. The new body is remarkable both for its great stability and in the fact that it may be recognized even in highly dilute solutions. R. Fassbender has found it to be present in all commercial extracts which he has had

opportunity to examine. The interesting observation has been made by E. v. Gorup and H. Will, that the secretions of the irritated glands of the pitcher plants, "Nepenthes phyllamphora" and "N. gracilis," have the power of dissolving fibrin, albumen, flesh, and legumin, converting them into peptones, and have an acid reaction; while the secretions of non-irritated pitchers (such that contained no insects) had a neutral reaction, and did not possess any digestive properties, but acquired them in a high degree by the addition of certain vegetable acids. Starch is not altered by the ferment. A very active ferment has also been discovered by Kosmann in the young leaves, buds, or flowers of certain plants, such as buds of Ulmus campestris, Populus nigra, Quercus pedunculata, and Corylus avellana, in the flowers of Cornus sanguinea and Prunus spinosa, in the young leaves of Chelidonium majus and Digitalis purpurea. The new ferment possesses the power of transforming cane-sugar into glucose, starch into dextrin and glucose, and to split glucosides into glucose and the secondary principle, and the author communicates the method by which he has extracted it from young digitalis leaves. The observation is calculated to explain some of the discrepancies respecting digitalin as obtained by different experimenters, and will perhaps throw further light upon the changes to which the active constituents of some plants are subject during the process of their extraction. An important observation, relative to the changes to which "cantharidin" is subject while a compound of cantharides, has also lately been made by R. Wolff, of Buenos Ayres, his observation being based upon experiments made with "Lytta aspersa," which is there generally employed. He found that after extracting the powdered flies with ether, there still remained a portion of vesicating substance, which, when isolated by suitable means, proved to be a compound of cantharidin and ammonia. This compound proved to be insoluble in all of the menstrua that have been proposed for the extraction of cantharidin, with the single exception of acetic ether, which decomposes it, and on evaporation leaves cantharidin. The observation explains why larger yields of cantharidin are obtained by treatment with acetic ether. The cantharidin ammonia appears to be capable of uniting with a further quantity of ammonia, forming a crystalline compound, which is distinct from that before mentioned. The ammonia compound is present in proportion to the change which the flies have undergone by keeping. The experiments of I. C. Thresh on the active constituents of capsicum, alluded to in

the last report, have been continued by him, and he has succeeded in isolating a neutral crystalline substance, which he names "capsaicin," and which he considers to be the active principle. In its ultimate composition it corresponds to the formula $C_9H_{14}O_2$, but further experiments are necessary, and are being made, to determine its relationship to other principles. In a recent communication, Lippman and Hawliczeck state that they have examined artificial oil of bitter almonds, prepared by Wilhelmi, of Leipzig, from toluol, and that they have found it to be identical with true oil of bitter almonds which had been deprived of its hydrocyanic acid by distillation with milk of lime and ferrous sulphate. The identity of artificial with true volatile oil of mustard was established by experiments of Gerlich, detailed in last year's report; the conversion of sulphocyanide of allyl produced at a low temperature, into a modification having all the properties of true volatile oil of mustard occurring on exposure to a certain higher temperature. E. Schmidt has now determined that when myrosin and myronate of potassium are caused to react on each other at a temperature of 32° F., small quantities of sulphocyanide of allyl, corresponding to the compound that has not been heated, are obtained along with much volatile oil of mustard. W. A Shenstone has made some interesting experiments, by which he shows that commercial "brucia" contains a portion of strychnia, and he gives a method by which the strychnia may be completely removed. The author confirms the results of Cownley that pure brucia is not transformed into strychnia by treatment with nitric acid, according to the method by which Sonnenschein claimed to have obtained it. In "silicotungstic acid," Dr. R. Godeffroy has discovered an extremely delicate reagent for alkaloids. It is so sensitive that $\frac{1}{130000}$ of hydrochlorate of atropia, $\frac{1}{50000}$ of hydrochlorate of quinia, or $\frac{1}{200000}$ of hydrochlorate of cinchonia, afford distinct reactions.

Under inorganic chemicals we have to note the discovery of two new metals, "Neptunium" and "Lavœsium." Neptunium was obtained in small quantities by K. Hermann, from the mineral "Columbite." It appears to belong to the Tantalum group of metals, occupying in this group the second position as regards its atomic value, which is 118; that of tantalum being 176, of niobium 114.2, and of ilmenium 104.6. Some of its compounds and reactions are described, and appear to be quite distinct from those of the other metals belonging to the same group. Lavœsium is stated by its discoverer, M. Prat, to be a silver-white metal, which he claims to

have found in many minerals, and notably in iron pyrites. Whilst of a silvery-white color, its reactions, as well as the colored rays produced by it in the spectroscope, coincide very closely with those of copper. The subject requires further examination.

Among the new preparations that have attracted attention during the past year, "dialysed iron" occupies a conspicuous place. It is new, however, in the United States, only in so far that attention is now prominently drawn to it, while in Europe, and especially in Germany, it has been comparatively well known since 1867, when Dr. Wagner, an apothecary of Buda-Pest, first conceived the idea of introducing it into medicine. Dialysed iron, in fact, is as old as the process of dialysis, since Graham, in his valuable treatise on dialysis (in 1861), described a similar product, obtained by the dialysis of solution of ferric chloride; indeed, Wagner admits that Graham's observations suggested to him the idea of preparing his "ferrum oxydatum dialysatum." But while we have to give credit to Wagner for the introduction of a valuable remedial agent, his evident aim to introduce it in the form of a specialty, and his failure to communicate a distinct method for its production, have materially marred the credit that would otherwise have been accorded him, and it has remained for more disinterested experimenters, such as Grossinger, Dragendorff (in the "Pharmacist," 1872), and especially Dr. Hermann Hager, to lift the veil with which Wagner found it expedient to obscure his preparations. The papers communicated on this subject during the past year confine themselves mainly to methods of preparation which are based upon the circumstances that when carefully prepared, pure hydrated ferric oxide is treated with a comparatively small proportion of ferric chloride, observing that the temperature be not much higher than 60° F., the hydrated oxide is completely dissolved, and a solution of peroxychloride of iron is formed after several days' standing, which, when subjected to dialysis, loses more of its chlorine (as ferric chloride?), and finally, after one or two weeks' dialysis, it acquires a condition in which it will no longer respond to the ordinary reactions for ferric salts, nor occasion a white precipitate on the addition of solution of nitrate of silver. By all the formulæ published, it is aimed to secure a product that contains five per cent. of ferric oxide; such a solution having a sp. gr. = 1.046, and corresponding to the original preparation of Wagner.

Dialysed iron is a transparent dark-brown liquid, which is perfectly neutral, nearly tasteless, and but slightly styptic, keeps well,

may be mixed with pure water or alcohol in all proportions, gives no black reaction with tannic acid, and no evidence of chlorine with nitrate of silver. It may be concentrated so as to represent seven to eight per cent. of ferric oxide, if the evaporation is conducted at 158° F., but when the solution has reached that degree of concentration, it is not safe to continue the heat, and further evaporation, which may be continued to dryness without change to the product, must be conducted at a temperature not exceeding 63.5° F. The dry product is again soluble in water in an unchanged form. Solutions of dialysed iron are precipitated by alkaline and saline solutions; but sugar prevents such precipitations altogether, for which reason syrup or sugar are recommended as vehicles for its administration. Dr. Hager has found dried dialysed iron, prepared as before mentioned, to be composed of 1 molecule ferric chloride, 12 molecules ferric oxide, and 3 molecules water; but other experimenters have obtained compounds in which the relation of ferric oxide to ferric chloride was much larger, and its constitution cannot, therefore, be regarded as established. Simultaneously with his formula for dialysed iron, Dr. Hager communicated a method for preparing a solution which he named "ferrum peroxydatum chloridatum," and which, in all respects, except in the method of its preparation, is claimed by him to be identical with dialysed iron. It is simply a saturated solution of hydrated ferric oxide in solution of ferric chloride, the former being added in fresh quantities until it is no longer dissolved. It is singular, however, that this process has not been received with more favor, if we may so judge from the fact that the original process of dialysis is the one still being discussed, whereas, if Hager is correct, the product obtained by the much less tedious method of solution should give the same result, and therefore be preferred. The reason for this may, perhaps, be found in the circumstance that other operators were not as successful as Dr. Hager in carrying out his second process. From all information that can be gathered, the preparation of both the solution of dialysed iron and that of the oxychloride obtained by direct solution, require extreme care, skill, and experience, and it is therefore quite probable that from the lack of the one or the other, operators may be disappointed in their results. Quite recently Dr. Wagner has introduced a preparation under the name of "ferrum catalyticum," which appears, from experiments made by Dr. Hager, to differ in no way from dialysed iron, or from Hager's solution of peroxychloride, except in its strength. As in

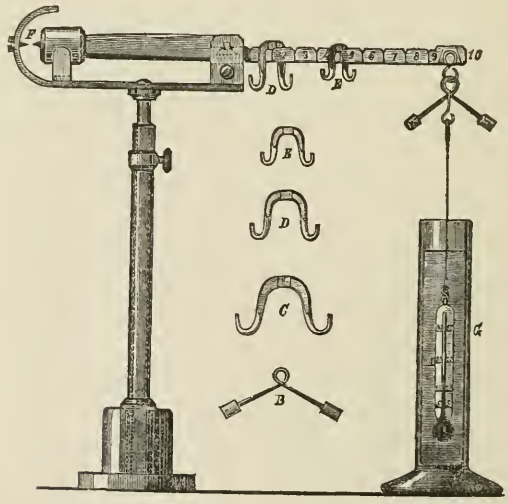
the case of ferrum dialysatum, Dr. Wagner gives but very meagre information in regard to its preparation. Dr. Hager, however, considers that it is prepared by a method of solution, perhaps similar to his method, as indeed its name, catalytic iron, already implies.

PHARMACY.

APPARATUS AND PROCESSES.

Mohr-Westphal's Specific Gravity Balance.—The construction of this ingenious instrument, which permits very exact and rapid determination of specific gravity, depends upon the principle that the loss of weight which one and the same body suffers in different liquids is proportioned to the density of the latter. Upon one arm of the balance (Fig. 1), which is divided into 10 equal parts, is

Fig. 1.



suspended, by means of a fine platinum wire, the thermometer, *A*, which is exactly balanced by the other arm. *B*, *C*, *D*, *E*, represent the shape of the weights, the first three being made of brass, the last of aluminium. *B* and *C* are each equal to the loss of weight (v) of the thermometer, *A*, when immersed in water; *D* is equal to

$\frac{1}{10}$th of v, and *E* is equal to $\frac{1}{100}$th of v. If it is desired, for instance, to determine the specific gravity of urine with this balance, the urine is poured into the cylinder, *G*, into which the thermometer, *A*, depends. The weights are then so attached that while *A* is completely immersed, exact equilibrium is restored, which may be recognized by the correspondence of the points at *F*. Supposing it has been necessary, in order to restore equilibrium, to suspend *B* upon the division 10, *D* upon division 2, and *E* upon division 5, the specific gravity of the urine would be 1025. New Remedies, March, 1877, p. 78.

Ancient Metrical System.—Hans M. Wilder extracts the following from Manuf. and Build.: "From the library of Sardanapalus, King of Assyria (found by Layard at Nineveh), it is proved that the Assyrians, some three thousand years ago, had a system of weights and measures almost as philosophical and methodical as the French metrical system, all units of surface, volume, and weight being derived from a single linear unit. The base of the system was the cubit or elbow (equal to 20.67 of our inches). These cubits, multiplied with 360, gave the stadium measures for great distances. The fundamental unit of surface was the square foot (foot equal to three-fifths of the cubit). The cubic foot constituted the metreta (bushel), which, with its subdivisions, was the standard of measure of capacity. A metreta of water was the talent, the unit of all measures of weight. The sixtieth part of the metreta gave the mine, and this divided into sixty parts the drachm. The weight of the metreta (of water) was about seventy avoirdupois pounds, the mine about 18.7 ounces, and the drachm about 159 grains. The sexagesimal system appears to have been used in all these calculations, and is evidently a very practical one, combining the advantages of the decimal and duodecimal system." A. J. Ph., March, 1877, p. 133.

Metrical Weights.—Prof. J. M. Maisch has contributed a valuable paper on the use of metrical weights in prescriptions. The difficulty of adapting these weights to pharmacy and medicine is not regarded to be as great as seems to be generally apprehended, and the author thinks that physicians could very materially promote their introduction, since by writing their prescriptions in quantities indicated by the metric system, the apothecaries would be compelled to procure a suitable set of weights; this would be a great step towards harmonizing the various pharmaceutical preparations of our

Pharmacopœia with those of other countries. The chief difficulty seems to consist in the differences in the ponderability of the same volume of different liquids. But the difficulty even here is not so great as might be expected, and the author gives explicit examples, illustrating the way in which this may readily be overcome with all liquids of known density. Thus, a fluid ounce of water weighs 455.69 troy grains, or within less than 8 grains the same as 30 grams (463 grains); 15 grams of water are therefore equal to a tablespoonful, 7.5 to 8 grams a dessertspoonful, and 3.7 to 4 grams a teaspoonful. Knowing the sp. gr., for instance, of glycerin to be 1.25 (water being 1.00) the glycerin is one-fourth heavier than the water, and is expressed by $\frac{5}{4}$; the weight of a tablespoonful of glycerin, expressed in grams, may then be readily ascertained by multiplying $\frac{5}{4}$ by 15 (= 18.75 grams). The same rule, of course, holds good for liquids lighter than water. For solids it suffices to divide the number of grains required by 15, in order to attain approximately accurate quantities, the error being within the fraction of $\frac{1}{34}$th. This error is so insignificant as to make a difference of but $\frac{1}{5}$th grain when weighing 10 grains, the quantity derived being increased to that amount. The paper deserves the careful attention of both physician and pharmacist. A. J. Ph., October, 1876, pp. 457–462; from Med. and Surg. Rep., September, 1876; also A. J. Ph., Feb., 1877.

Hydrometers.—B. Hirsch gives a critical review of the various hydrometers in use, and concludes that Wittstock's hydrometer, constructed for weights, is preferable to all others for pharmaceutic purposes. But even this admits of improvement, and he has therefore induced W. Zorn, of Berlin, to construct the instrument according to his ideas, and purposes to name the new instrument *Normal Aerometer*. The manufacturer is now prepared to furnish these in sets, contained in a handsome case, and composed as follows:

3 glass spindles.
1 set of weights and pincette.
1 thermometer.
1 glass cylinder.

The *spindles* are constructed as shown by Fig. 2, and being less slender than Wittstock's, are more durable, and require less liquid to float. The shape of the weighted end for the reception of the mercury is such as to permit ready cleansing and drying. The receptacle for the weights is attached to the apex of the instrument

by means of an enamelled rod, which is fastened with luting, or it is melted in, an operation which, however, makes the instrument

Fig. 2.

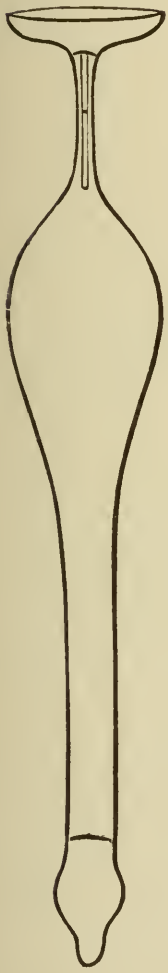
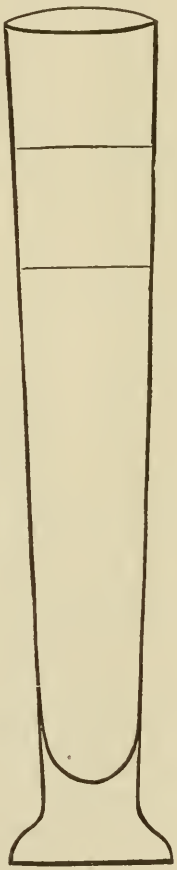


Fig. 3.

Fig. 4.



more expensive. The three spindles are of such weight that they will sink to the mark on the enamelled stem; the lightest in liquid

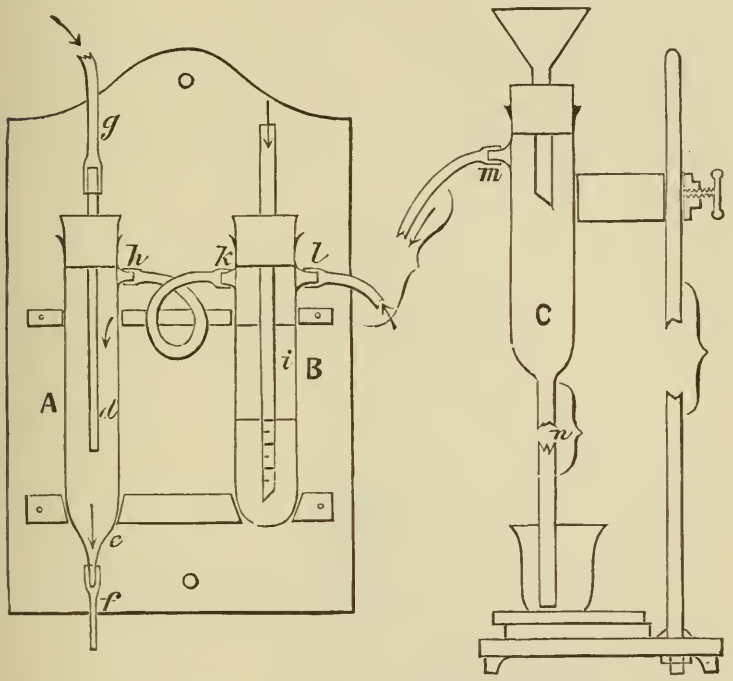
having a sp. gr. of 650, the next in liquids having a sp. gr. of 1000, the heaviest in liquids having a sp. gr. of 1400, and they are, by the aid of the weights, used for liquids between 650 and 1000, 1000 and 1400, and 1400 to 2000 respectively. The *weights* are of brass and German silver, the first-named metal being used for the larger, and the latter for the smaller divisions, 0.5 (corresponding to 2 centigrams) being the smallest. The *thermometer* has the shape given by Fig. 3. Beneath the mercury bulb a rather flat bulb of glass is attached, which facilitates the mixing of the liquid by simply passing the thermometer up and down the cylinder. It is of such length that it will extend slightly out of the cylinder when placed into it, and its volume is considerably less than that of the spindles. The *glass cylinder*, which is illustrated by Fig. 4, is perfectly regular in shape, about 20 centimetres high by $3\frac{3}{4}$ at the apex, and $2\frac{1}{2}$ at the bottom, which is also concave, so as to admit of easy cleansing. This shape is given to it in order to accommodate the spindles without necessitating the introduction of too much liquid, two horizontal lines indicating the minimum and maximum quantities that should be introduced. Arch. Ph., Aug. 1876, pp. 107 to 133.

A New Hygrometer.—Prof. Klinkerfuss has invented a new hygrometer, which is constructed by uniting 2 bundles, each consisting of 4 hairs, to a vertical brass rod, to the apex of which an index is affixed, which responds to the slightest expansion or contraction of the hairs, and indicates upon a dial suitably divided at once the percentage of moisture in the atmosphere. The action of this instrument, which may be called a hair-hygrometer, is dependent upon the circumstance that the hairs expand in a moist and contract in a dry atmosphere. By making the proper allowance for the temperature at the time of observation, and by the aid of a table provided for this purpose at the foot of the instrument, the dew-point can readily be read off. The instrument has been in use for some time, and has proved to be practically of much virtue. Each instrument is accompanied by a description and rules, which enable the determination of the weather that may be expected for the following day, etc. Ph. Centr. H., Sept. 7th, 1876, p. 306.

Rapid Filtration.—E. C. H. Hildebrand describes an apparatus for rapid filtration, a combination of Weil's filtering-tube and Scheibler's drop aspirator, by which he obtains uniform good results, without the usual danger of breakage of the filter. The ap-

paratus is illustrated by Fig. 5. It consists of the filtering-tube (C), the upper part of which is 6 inches long by 1¼ inches diameter, while the narrow part is but $\frac{5}{16}$ inch in diameter and 14 inches long. The funnel is inserted air-tight by means of a perforated rubber cork, as shown in the illustration. This filter-tube is con-

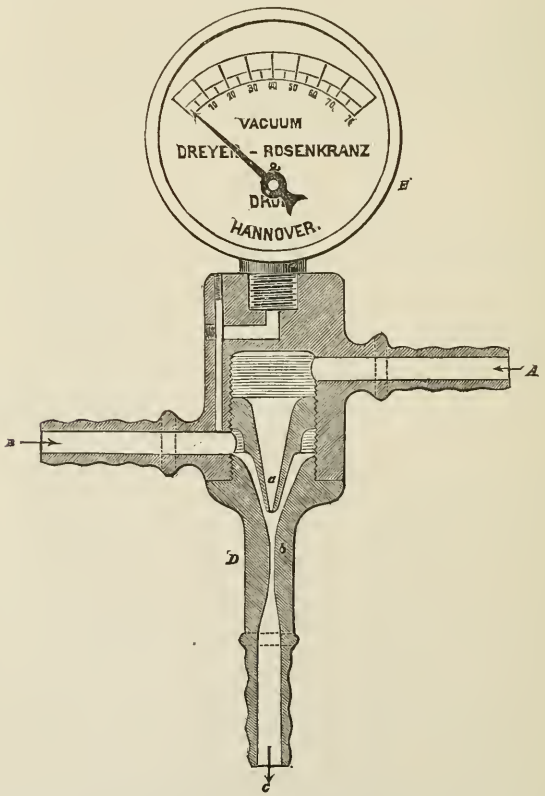
Fig. 5.



nected at *m* by means of a rubber tube with a vacuum regulator (B), which may be constructed of an ordinary 6-inch test-tube, having an internal diameter of 1⅛ inches or more, and containing mercury to the height of 2 inches, and water above that to the same height. The tube, *i*, which is 9 inches long and $\frac{3}{16}$ inch internal diameter, is inserted through a soft cork, its lower end is cut off obliquely, and is provided with marks showing ⅛ inch, beginning at the obtuse angle of the oblique cut. By raising or lowering the tube into the mercury, the pressure may readily be diminished or increased. This portion of the apparatus is in communication with the drop aspirator by means of a rubber tube attached at *k* and *h*, the two portions being attached to a board and hung up at a suitable height against a wall. The aspirator is composed of

a 1-inch glass tube, 6 inches long, drawn to a narrow point, *e*, of the $\frac{1}{8}$ inch bore, to which is attached a rubber tube, *f*, of the same internal diameter, and 5 or more feet long. The glass tube, *d*, is inserted through a perforated rubber cork, is $\frac{3}{16}$ inch internal diameter, extends downward 3 inches, and upward 1 or 2 inches, and communicates by means of the rubber tube, *g*, with an elevated vessel containing water. The flow of water is so regulated that it shall drop rapidly and regularly, each drop of water falling into the narrow tube inclosing a quantity of air, and acting the part of the piston of an air-pump. The author gives some general information on the subject of filters, filtration, etc., in this connection, for which the reader is referred to the original paper in A. J. Ph., July, 1876, p. 289.

FIG. 6.



New Filtering Apparatus.—Hermann Fischer has designed a very handy form of quick filter, which is designed for *water pressure*

(not falling water), and may be used on any portion of the work-table in the laboratory. *A*, *B*, and *C*, in the annexed cut, Fig. 6, are intended to receive rubber tubing, and the neck, *D*, may be fastened by a clamp to an ordinary retort-stand. The water entering at *A* passes through the inner nipple, *a*, becomes mixed with the air which it attracts from the filtering apparatus through *B*, and after passing the contracted portion at *b* flows off through *C*. Since it is desirable in many operations to control the amount of rarefication, a vacuum gauge is attached to the upper portion. The apparatus is manufactured by Dreyer, Rosenkranz, and Droup, in Hanover, Germany, and costs 10 marks without, and 20 marks with gauge. New Rem., Feb. 1877, p. 42.

A Simple Suction and Pressure Apparatus is recommended by C. Bulk, which may be regarded as a modification of those proposed by Christiansen, Arzberger, and Tulkowsky. It consists of a glass tube, *a* (Figs. 7 and 8), contracted by being drawn out near its upper third, and containing a smaller trumpet-shaped tube, *b*, reaching to

Fig. 7.

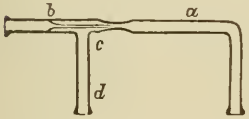
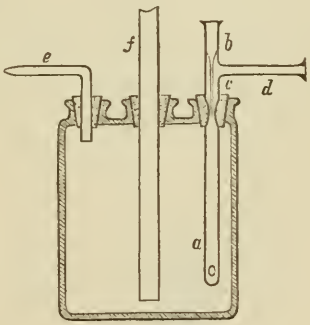


Fig. 8.



the narrow part (as may be seen in the figure), and joined at *c* with the lateral tube, *d*. A stream of water flowing through *d*, after passing through the constriction, being compelled to expand in the wider portion of the tube, will diminish in rapidity, and will therefore draw air from the tube, *b*. If the tube *a* were straight, however, the current of water would soon begin to rotate and become interrupted, in which case it would attract but little air. This is obviated by the bending of the tube, *a* (Fig. 7), or else by blowing a lateral hole into the tube (Fig. 8), whereby all rotation of the current of water is prevented. This small apparatus is so powerful that with a pressure of water equivalent to a column of 10

metres in height, it will lift 720 millimetres of mercury, and aspirates one-half litre of air each minute. But even with a small pressure of water it works satisfactorily, and forms an excellent aspirator for rapid filtration, as it may be used upon any portion of the work-table and be connected with the water and waste-pipe by suitable rubber tubing.

The air which is aspirated by this apparatus may be converted into a stream of compressed air. For this purpose the exit portion of the suction apparatus is passed through one of the necks of a three-necked Woulff's bottle (Fig. 8), which carries in the others a small glass tube, *e*, drawn to a point, and a safety tube, *f*. On allowing a current of water to enter the bottle through *a*, air is drawn from *b*, and is expelled at *e* under pressure, the amount of which depends on the height of *f*. Should compressed air become necessary, *e* may be closed, and the safety tube, *f*, connected with a pipe passing downward; the suction power of the apparatus is thereby increased. New Rem., April, 1877, p. 101, from Ber. Chem. Ges., 1876.

A Minim or Drop Filter.—By Figs. 9 and 10 a little contrivance is represented for obtaining perfectly clear filtered drops of a liquid, such as collyria, opium or arsenic preparations, which the patients are required to take by drops, and solutions of alkaloidal

Fig. 9.

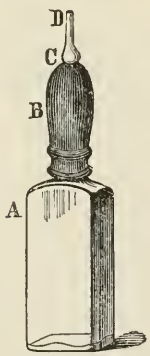


Fig. 1.

Fig. 10.

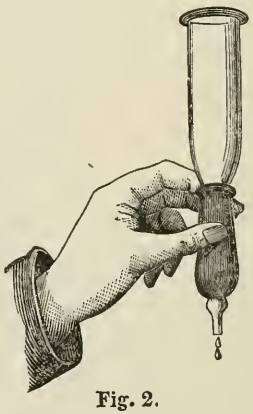


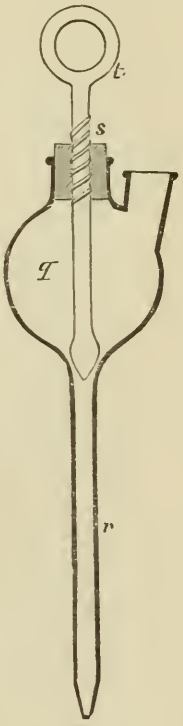
Fig. 2.

salts used in hypodermic injections. A small vial, either square, as in *A* (Fig. 9), or round, of the capacity of about 1 fluid ounce, is provided with a small rubber cap, *B*, having somewhat the shape

of an olive; the upper extremity of this bears a small glass tube, *C D*, of very fine calibre, and containing in the small *bulb*, *C*, a pellet of cotton. When using it, it is merely inverted (Fig. 10), and by gentle pressure upon the rubber cap the desired number of drops obtained. The cotton acts not only as a filter for the liquid, but likewise for the air which enters the vial. New Rem., May, 1877, p. 137, from Rép. de Pharm., 1877, 186.

Simple Separatory Funnel.—The accompanying figure (11) illustrates a simple separatory funnel as constructed by C. Bulk; it consists of a glass globe, *q*, having two tubulures and a delivery tube, *r*. The latter is closed by the conical end of a glass rod, which at *s* is fastened into a cork and can be raised and lowered by means of a glass thread fused spirally upon the rod, and by turning the handle, *t*. The apparatus has been frequently employed by the author, and works satisfactorily. A. J. Ph., April, 1877, p. 174; Ber. Chem. Ges., 1876, p. 1898.

Fig. 11.



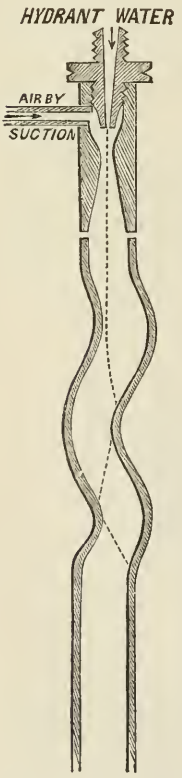
Adjustable Supports for Funnels, Percolators, etc.—E. C. H. Hildebrand gives instruction for constructing a simple support for funnels, percolators, etc. The paper is accompanied by illustrations, which aid the author's explanation. It is not suited for extraction. A. J. Ph., Sept. 1876, p. 400.

Filtering-papers.—T. Greenish has observed that the gray filtering-papers of British commerce, which are circular and of foreign manufacture, as well as the gray sheet filtering-paper of the Dutch, are not well suited for filtering purposes on account of their composite and impure character. He had observed that in liquids in which fungoid substances had accumulated, these had formed around a fibre, the presence of which was due to the paper through which the solution had passed, and that solutions passed through such paper were more liable to the presence of fungi than others where no filtration had been resorted to after solution. Another objection to this gray variety of paper is the presence of wool. White filtering-papers are mainly made from linen; Swedish paper

being the best, while the Rhenish paper is very nearly as good, especially of late years, since the Swedish paper has slightly deteriorated. English white filtering-paper contains a little cotton admixed with the flax, but is a good paper. Scotch white filtering-paper is also said to be very good, although the author has not had opportunity to examine it. The quality of the paper is in proportion to the thoroughness with which the fibres are crushed and torn, and the purity of the water used in its manufacture. Yearbook of Ph., 1876, p. 598.

Swedish Filtering-paper.—Uelsmann draws attention to the considerable percentage of phosphoric acid contained in Swedish filtering-paper, a circumstance which renders a correction necessary in the determination of phosphates in acid solutions filtered through such paper, or that the paper be previously thoroughly washed with dilute nitric acid. A filter of 80 mm. diameter was found to give 6 milligrams of molybdenum precipitate. Wittstein's observations, based upon analysis made by A. von Wich, seventeen years ago, seem to indicate that Swedish filtering-paper contains a much larger percentage of ash than formerly. v. Wich found, as the mean of several analyses, 0.420 per cent. of ash, which contained phosphoric acid amounting to 0.001 per cent. of the paper used. The quantity obtained by Uelsmann is nearly a hundred times as much. It was also observed that the phosphoric acid contained in the older sample of filtering-paper was readily removed by dilute hydrochloric acid. Ph. Centr. H., Aug. 17th, 1876, p. 282.

Fig. 12.



Aspirator, Improved Form.—R. H. Richards recommends the form of aspirator illustrated by Fig. 12. A glass tube should be bent of the form represented. This is essential, as it serves to break up the water-jet into foam and then starts the suction. He finds a hydrant pressure of about 20 pounds on the square inch, equivalent to 40 or 50 feet column of water, will easily exhaust to within 1 mm. of the tension of aqueous vapor, and will cause a flask of water to effervesce as the dissolved air is disengaged. Ch. News, Sept. 29th, 1876, p. 141.

Aspirator.—A. Percy Smith recommends and describes the aspirator illustrated by Fig. 13, which requires a water pressure of but 5 pounds to the square inch to produce a vacuum. The tubes, *A B*, are of glass, and placed diametrically opposite each other, so that the water issuing from the jet, *A*, passes smoothly down through *B*. *C* is the mercury governor, to regulate the pressure when the pump is used for filtering purposes. The rapidity with which this pump exhausts is very great. Ch. News, Oct. 13th, 1876, p. 163.

Aspirators, New Modifications.—H. R. Proctor, at a recent meeting, described a modification of the aspirator of A. Percy Smith. The new modification is illustrated by Fig. 14. Some

FIG 13.

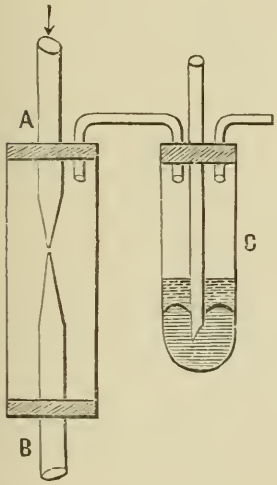


FIG. 14.

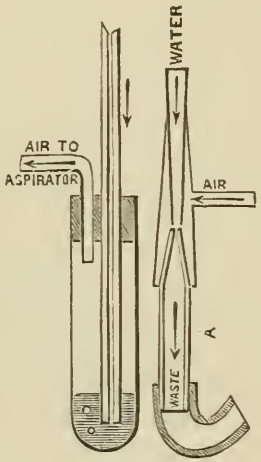


FIG. 15.

fragments of a common blowpipe are soldered together, as shown in the cut, and a glass waste-pipe is cemented into it at *a*. Over the lower end of this is slipped a piece of india-rubber tube, for the double purpose of checking the current (which is essential to efficient suction) and of conducting the water and air which are discharged into other apparatus. By means of this arrangement, which, as constructed by the author, is by no means perfect, a vacuum of 28 or 29 inches of mercury may rapidly be produced, even with a moderate pressure of water. The aspirator may be employed not only for vacuum filtration, but it is found most available for *distillations in vacuo*. Two flasks are connected in the usual way with a Liebig's condenser, by tightly fitting india-rubber

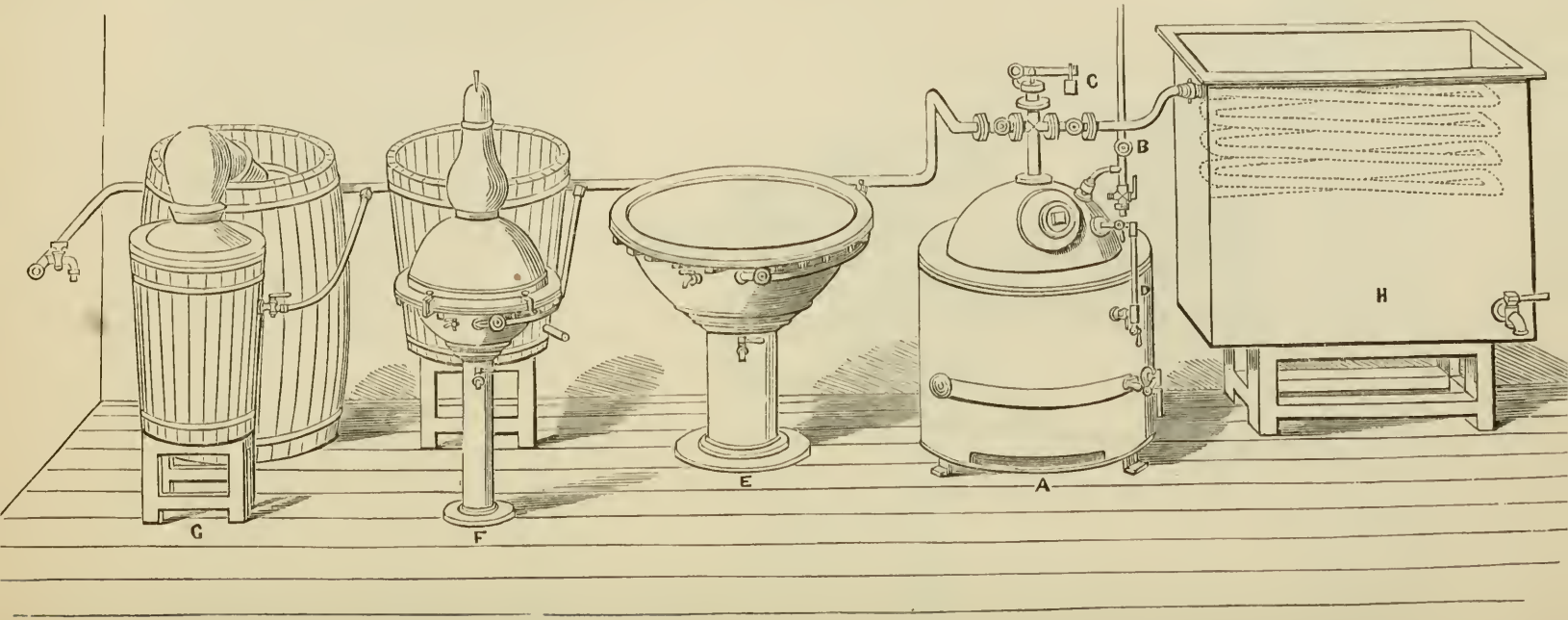
corks, one of which is pierced by a small tube connected with the aspirator. As soon as the apparatus is exhausted, the connection is closed by a pinch-cock, when a very gentle heat, applied to the flask containing the liquid to be distilled, will cause it to distil rapidly and without any possibility of loss.

Fig. 15 represents an arrangement which is intended to prevent the possibility of water receding from the pump into the connected apparatus, as it is apt to do if the water pressure varies from any cause, such as turning on an adjacent tap. It is particularly intended for such distillation, when the evaporated and condensed liquid is intended to be washed away with the waste water. A piece of barometer tube, slightly over 30 inches long, is fitted by a tight-fitting cork into a test-tube containing a little mercury. The flasks, etc., are connected with the upper end of this tube, while the aspirator tube passes through the cork into the test-tube. As the exhaustion proceeds the air bubbles through the mercury, but it cannot recede, since to do so it must force the mercury up the narrow tube. The mercury, therefore, forms an absolutely perfect valve, and may also serve as a pressure gauge, since on turning off the water it immediately rises till it balances the minus pressure of the vacuum. Ch. News, April, 1877, p. 140.

Pharmaceutical Apparatus.—Octavius Corder gives the following description of a "Pharmaceutical Apparatus" (Fig. 16) devised by him and found suitable for making such pharmaceutical preparations as may reasonably be expected to be prepared in the dispensing establishments of the present day.

A is a copper boiler holding about 12 gallons, fixed in a wrought-iron jacket and heated by a ring gas-burner. Gas is chosen because, while not as cheap as coal, it is clean, free from smoke, and can be started and regulated at pleasure. The boiler is supplied with water from the main by merely turning on the tap, B; it is provided with a steam gauge (safety valve?), C, which blows off at 5 pounds pressure; also with a water gauge, D, and with a suitable arrangement for blowing out the boiler whenever it becomes foul by deposit of lime, etc. H is a galvanized iron tank, provided with a tin worm, so that all waste steam may be condensed as distilled water. The whole of the pans, etc., being copper-tinned, all the condensed steam is available as distilled water. The pan, E, holds about 16 gallons, and is adapted for decoctions, etc.; its evaporating power is about 2 gallons per hour. The pan, F, holds 6 gallons, and being fitted with a suitable head and worm, is used

Fig. 16.

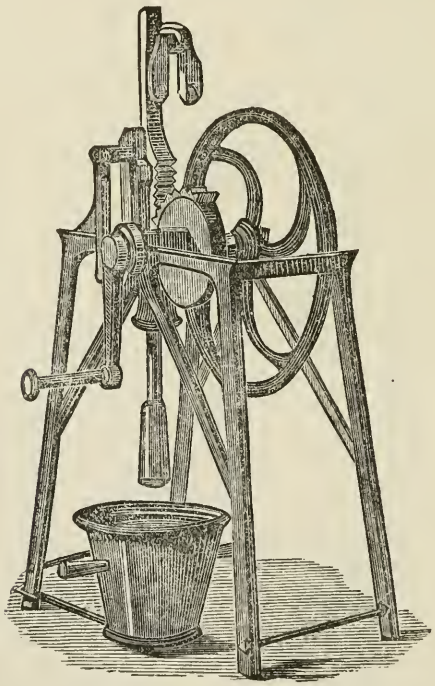


for all the medicated waters, and also for recovering alcohol during the preparation of extracts, etc. It distils about 1 gallon per hour. G is fitted with an earthenware still, holding about 3 gallons (Doulton & Watts's make), with head and worm of the same material, fixed in an oval jacket.

The amount of gas used is about 50 feet per hour, but by saving the condensed steam, sufficient distilled water is obtained to more than pay the heating (estimate, of course, for England—Rep.). It is well to cover the top of the boiler and the sides of the pans and pipes with felt, which effectually prevents considerable loss of heat by radiation. Ph. J. Trans., Oct. 28, 1876, p. 349.

Powdering Apparatus.—The simple apparatus which is illustrated by Fig. 17 is intended chiefly for the use of those who are compelled

Fig. 17.

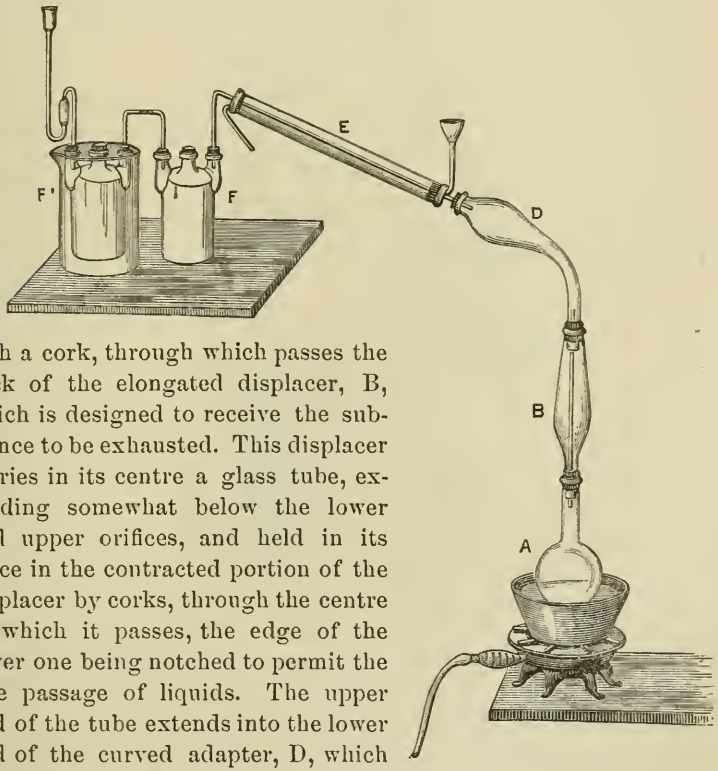


to do their own powdering without having access to steam or other power, and it is said to give great satisfaction to all who have used it. Flaxseed meal, mustard, gum arabic, cinchona bark, rhubarb, alum, cream of tartar, cubebs, and many other brittle drugs are rapidly comminuted, and may be obtained of any degree of fineness

by pouring the powdered mass from time to time through the proper sieves. About 75 pounds of flaxseed and about 50 pounds of mustard may be obtained in saleable powder during an ordinary day's work. The apparatus takes up but little room and is, nevertheless, very solid and durable. The pestle weighs about 56 pounds, and its fall being about 1 foot, the power is very large. The powerful gearing of the lifter is incapable of being broken, and in spite of the weight of the pestle, the number of strokes per minute may reach 55 to 60 without difficulty. The price, in Paris, varies from 170 to 280 francs, New Rem., March, 1877, p. 77.

Apparatus for Continual Displacement.—A convenient apparatus, which permits a continued digestion or percolation with volatile liquids, is that proposed by P. Cazeneuve and O. Caillol in the "Rép. de Pharm." (Feb. 25, 1877). The flask, A (Fig. 18), is provided

Fig. 18.

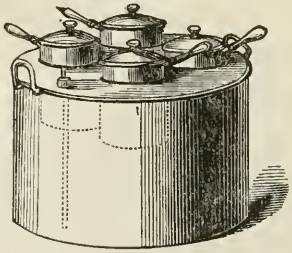


with a cork, through which passes the neck of the elongated displacer, B, which is designed to receive the substance to be exhausted. This displacer carries in its centre a glass tube, extending somewhat below the lower and upper orifices, and held in its place in the contracted portion of the displacer by corks, through the centre of which it passes, the edge of the lower one being notched to permit the free passage of liquids. The upper end of the tube extends into the lower end of the curved adapter, D, which serves as primary condenser. This is again connected, in the

manner shown in the cut, with a Liebig's condenser, E, which is so inclined that all condensed vapors are compelled to run back into the flask, A, besides being provided with extra receivers, F F′, one or both of which are surrounded by a freezing mixture, and which are intended to arrest and condense any vapors that may have escaped from the upper end of the condenser. As soon as the exhaustion of the material in B is completed, the condenser, E, may be connected with D by means of a bent-tube, and reversed so as to incline the other way, by which means the condensed liquid may be recovered. Highly volatile liquids, such as ether or bisulphide of carbon, are apt to occasion trouble in ordinary reflux condensers, on account of the drops of condensed liquid being met in their downward road by ascending vapors, which often expel the condensed liquid by force. In the present case, the flasks F and F′ are specially intended to prevent this loss. The last one of these is, moreover, provided with a safety-tube containing mercury, whereby an additional safeguard is provided. New Rem., April, 1877, p. 108.

Useful Form of Water-bath.—Attention is drawn to a useful form of water-bath, in "New Rem." (Feb. 1877, p. 45). According to the kind of work it is intended for, or according to the whim and taste of the owner, it may vary in size, shape, or material, but one of the most generally useful forms, at least for the pharmacist, is that which is represented in the annexed cut (Fig. 19), as it may

Fig. 19.

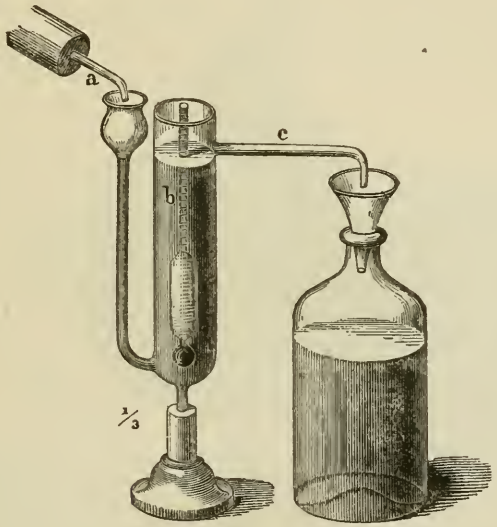


serve a variety of purposes. The outer pan should be made of tolerably strong copper; the top is provided with a number of holes to receive either infusion pots, capsules, or flasks, and a small aperture is intended for the insertion of a thermometer. The top may be made so as to be removable, to be replaced by a set of concentric rings made of strong copper, and intended to support

larger sized capsules or evaporating dishes. The bottom, of strong copper, must be brazed on.

Mohr's Controlling Receiver.—In distillations it happens not unfrequently that the finished distillate is weakened and perhaps spoiled by subsequent heavier condensed products, unless some precaution is adopted to indicate the moment when the receiving vessel must be changed. To obviate this difficulty, Mohr has devised an apparatus which he terms "Destillations-hüter," and which may be translated into "controlling receiver" (Fig. 20). It is constructed of

FIG. 20.

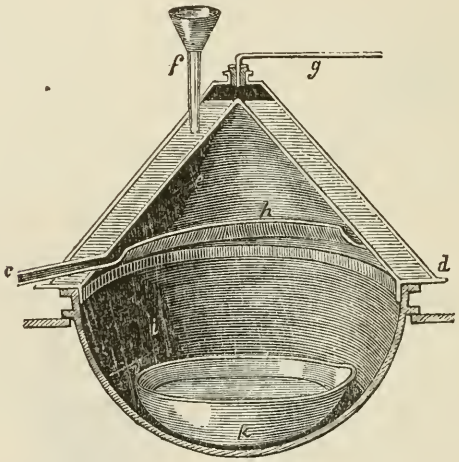


glass and almost explains itself. The condensed distillate flows in at *a*, enters the cylinder, *b*, from below, and passes by the overflow, *c*, into the main receiver. The cylinder, *b*, contains a small hydrometer, comprising a small portion of the specific gravity scale, appropriate to the particular liquid to be condensed. For instance, a small hydrometer, bearing on a scale of two and a half inches the specific gravities from 0.790 to 0.850, is adapted for alcoholic liquids. The whole range of specific gravities occurring in pharmaceutical liquids extends from about 1.900 (sulphuric acid) to 0.720 (ether), and contains therefore 1180 degrees. The small instrument just mentioned contains about 60 degrees; hence the division of the whole range of specific gravities over such small

scales would necessitate about 19 or 20 spindles. But this number is in practice unnecessary, because in many cases other criteria are relied upon to distinguish between fractions of a distillate. Since the condensed product gradually increases in density, it is only necessary to observe the gradual rise of the hydrometer, and to change the main receiver whenever the proper moment arrives. New Rem., May, 1877, p. 134.

A Vapor Condenser.—The apparatus illustrated by Fig. 21, while

Fig. 21.

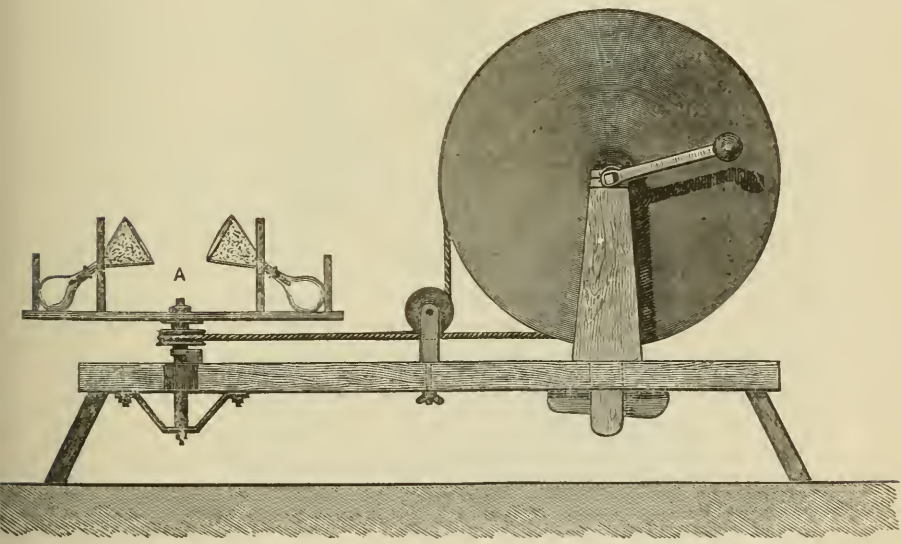


by no means new, is not so well known as it deserves. It is intended for the recovery by slow distillation of alcohol, ether, or other volatile liquids from solutions which have to be evaporated slowly, either to produce a crop of crystals, or for other causes. The apparatus consists of a turned iron or copper kettle, into which fits a hood with double walls, the space between which is kept filled, by means of the funnel, *f*, with cold water, the excess of the latter flowing off through *g*. Along the inner surfaces of the hood there is attached a gutter, sloping downwards towards the outlet-pipe, *c*, which receives the condensed vapors and carries them into the receiver. Where water pressure is available the funnel, *f*, may advantageously be replaced by a tube soldered into the outer wall of the hood near the bottom; a rubber hose may be attached to this, and more perfect condensation is thereby effected. The application of heat may be effected in various ways, to suit

the volatility of the liquid or the facilities of the operator. In the absence of such an apparatus, an ordinary still may be used. A bath of glycerin, into which the vessel containing the liquid to be evaporated is partially immersed, serves an excellent purpose. New Rem., January, 1877, p. 10.

Centrifugal Drying Machine.—All needle-shaped crystals are apt to retain large quantities of mother-water in their interstices, and their purification, by means of repeated solution and crystallization, often causes serious losses. In operations on a large scale, as in sugar-houses, epsom salt works, etc., specially constructed centrifugal machines are resorted to for the purpose of removing the mother-liquor, and these are generally well known. Less known, however, is perhaps the simple apparatus shown by Fig. 22, which is illustrated and described in "Mohr's Lehrbuch der

FIG. 22.



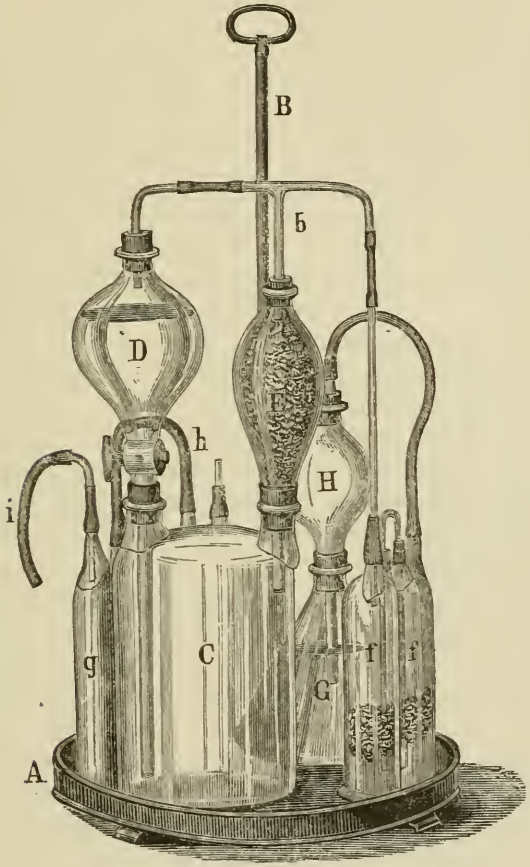
Pharm. Technik." The construction is exceedingly simple and intelligible without detailed description. The spindle at A carries a horizontal board or rotator provided with four upright pieces, the two inner ones of which contain an oblique tapering hole, into which the funnels may be firmly wedged in such a position that the lower sides of the funnels lie in a horizontal line. It is best to use two equally heavy funnels and receivers, exclusively intended

for this apparatus. The external uprights are intended merely as supports to the receivers. The cord which transmits the motion from the flywheel to the rotator should not be too thin, and at the same time somewhat elastic. A rubber cord probably answers best. When using the apparatus, the necks of the funnels are loosely covered with cotton, and enough of the crystals (previously drained by inclining the crystallizing dish) is placed into them. The orifice of the funnels may be closed with paper. Everything being in position, the wheel is set in motion, first gradually, then more rapidly, and after continuing some time the motion is again gradually diminished. The expelled mother-liquor may now be emptied, and the operation repeated until no more liquor collects in the receivers. The crystals are then removed from the funnels, and exposed to the air for a few hours, when they are ready to bottle. The process is then repeated with a fresh lot of drained crystals. Mohr recommends the following dimensions as most suitable for pharmaceutical laboratories, calculated for funnels of four inches aperture: diameter of flywheel nineteen inches; small wheels two inches; distance from inner uprights to rotator ten inches. New Rem., April, 1877, p. 102.

A Constant Generator of Chlorine, Ammonia, and Hydrochloric Acid.—Hermann Kämmerer has devised and describes the apparatus illustrated by Fig. 23, which will deliver an easily regulated either rapid or slow supply of chlorine, ammonia, or hydrochloric acid gas. Upon a sheet-iron tray, A, provided with a central rod, B, for lifting and carrying the whole apparatus, is placed the generating vessel, C, being a two-necked Woulff's bottle, which is filled to one-third of its capacity with chlorinated lime. One of its necks carries a globe, or separatory funnel, D, with a stopcock, containing hydrochloric acid mixed with one-half of its volume of water, and saturated with chlorine by introducing into it a small quantity of chlorinated lime. The other neck carries a pear-shaped glass globe, E, filled with pieces of glass (below), asbestos, and pumice (above.) Both connections are made by means of perforated rubber stoppers. D is connected with the T tube, b, by means of a short rubber tube. By allowing the acid to drop or flow upon the chlorinated lime in C, it is easy to regulate a slow or rapid generation of chlorine. The latter is, however, not given up until the calcium compound has been fully decomposed into hypochlorous acid and calcium chloride. On first allowing the acid to flow down, there is produced a greenish-brown solution, and afterwards development of chlorine. The

liquid in the flask becomes heated to such a degree, that the bottom of C would be in danger of cracking if allowed to stand upon the sheet-iron support. This is prevented by placing the Woulff's bottle upon a block of rubber. The chlorine gas passes first through

Fig. 23.



E, where all liquid particles which are carried upwards mechanically are retained, and then enters the wash-bottles, f f, containing water. *Both bottles are connected by a single bent tube, reaching nearly to the bottom of each.* In this manner any receding of the liquid in the wash-bottle is effectually prevented. If it is desired to dry the gas, it may be passed through sulphuric acid, contained in the bottles, g g, which are connected in the same manner as f f, and

the dry gas delivered by the tube, i. The flask, G, contains solution of soda; it is provided with the globe funnel, H, which sits *loosely* in the neck. Whenever the generation of chlorine is to be discontinued, the stopcock of D is closed, and the delivery tube, k or i, is connected with H. All excess of chlorine is thereby carried into the soda solution, where it is completely absorbed.

If the apparatus is to be used for the production of ammonia, the Woulff's bottle, C, is filled with pieces (of about 1 c.m.) of dry soda, and the globe funnel, D, is charged with a saturated solution of sulphate of ammonium, to which a little soda has been added. Decomposition takes place with production of considerable heat. The wash-bottles, f f. and g g, are replaced by jars containing lime and potassa, and the absorption flask, G, is charged with moderately dilute sulphuric acid. Between the T tube upon E and the drying jars, a small wash-bottle containing glycerin may be attached, in order to be better able to observe the rapidity of the current.

To generate hydrochloric acid, C is filled with large pieces of sublimed chloride of ammonium, D with concentrated sulphuric acid, and G with soda solution.

The editors of "New Rem." suggest that the apparatus may also be used for the generation of sulphuretted hydrogen, by charging D with dilute sulphuric acid, C with iron sulphide, and G with a concentrated solution of acetate of lead. N. Rem., Jan. 1877, p. 6, from Ber. Chem. Ges.

Phosphorus Lamp.—Pieces of phosphorus the size of a pea are introduced into a cut-glass vial, which is then filled one-third full of boiling olive oil, and hermetically closed with a light-fitting stopper. Upon lifting the stopper for a moment, the phosphorescence produced in the interior of the vial is sufficiently strong to replace the light of an ordinary dark-lantern. It is necessary to lift the stopper from time to time as the light becomes weaker, and may be used for six months before it is necessary to renew the material. The lamp has been introduced in Paris, and is used by the police and by night-watchmen in buildings containing inflammable material. Zeitschr. Œst. Ap. Ver., Sept. 10th, 1876, p. 414.

Enamelled Cooking Vessels.—Robert R. Tatlock has found that in some instances the milk-white porcelanous enamel with which cast-iron cooking vessels are now so commonly prepared is of such a character as to be objectionable in the highest degree on account of the easy action upon it of acid fruits, common salt, and other

dietetic substances, by means of which lead and even arsenic are dissolved out in large quantities during cooking operations. The following analyses of three enamels, taken from three cast-iron pots made by different manufacturers, are communicated by the author:

	No. 1. Per cent.	No. 2. Per cent.	No. 3. Per cent.
Silica,	61.00	42.40	42.00
Alumina,	8.00	2.88	6.06
Oxide of iron,	1.10	2.04	4.04
Lime,	3.02	0 16	0.78
Magnesia,	0.28	0.10	0.21
Oxide of lead,	...	25.89	18.48
Potash,	5.61	7.99	6.46
Soda,	20.67	14.67	19.25
Phosphoric acid,	trace	trace	trace
Arsenious acid,	0.02	0.42	1.02
Carbonic acid,	0.30	...	...
Borax,	...	3.45	1.70
Total,	100.00	100.00	100.00
Total bases,	38.58	53.73	55.28

The author shows that it was not so much on account of the presence of large proportions of lead and arsenic that the enamels are so objectionable, but because they are so highly basic in their characters that they are readily acted upon by feeble acid solutions, the lead and arsenic being thereby easily dissolved out. He thinks that no enamel should be admitted to use unless it was totally unaffected by boiling with a 1 per cent. solution of nitric acid, which he considers a very moderate test. Ch. News, Sept. 22d, 1876, p. 130.

Glaze for Earthenware.—Hugo Jaunasch recommends a new glaze for earthenware which is free from lead (see also Proceedings, 1876, p. 63). $2\frac{1}{2}$ parts of levigated chalk, 2 parts of calcined soda, 2 parts of boric acid, 1 part of saltpetre, and $\frac{1}{2}$ part of white sand are melted (fritted) at a low red heat; the mass is then ground very fine, and is then used for glazing in the usual way. The glaze may be colored in various shades by the addition of more or less manganese or red clay. Green may be produced by means of copper-ash, blue by means of smalts. According to the variety of clay and the temperature employed in the manufacture of earthenware

vessels, it may be necessary to add more boric acid. Ph. Centr. H., June 21st, 1877, p. 203.

Zinc-Plating.—Professor Böttger finds that copper and brass are rapidly coated with a bright surface of zinc, if a large excess of finely powdered zinc is boiled with a concentrated solution of caustic alkali for some time, and the article to be coated is then introduced, when it will soon acquire a mirror-like surface of zinc. The process is an improvement on a similar one recommended thirty-three years ago by the author, in which a concentrated solution of chloride of ammonium was used in place of the alkaline solution. N. Rep. Ph., No. 7, 1876, p. 442.

Tinned Copper Vessels, Removal of the Tin.—Prof. Böttger has recently communicated a very simple method for removing the tin from tinned copper vessels, which consists in filling the vessel with a concentrated solution of sesquichloride of iron. In the course of a few minutes the tin coating is completely removed, and the vessel may then be scoured by means of sand which has been slightly moistened with very dilute hydrochloric acid. Ph. Centr. H., June 14th, 1877, p. 198.

Non-actinic Glassware.—Hans M. Wilder strongly recommends the use of dark-yellow glassware for keeping such substances, solid or liquid, as are liable to injury by exposure to direct light. The author has found chlorine water and sulphuretted hydrogen water to keep well in such bottles; solution of nitrate of silver could be exposed to occasional direct sunlight in the shop window when contained in such bottles, while powdered digitalis and savin retained their green color well. The yellow glass used is said to be produced by the addition of carbon to the melted flint glass. A. J. Ph., Feb. 1877, p. 59. See also March, 1877, p. 97.

Dried Plants, Preservation of Natural Colors.—Although it is well known that by treating specimens of plants with alcohol or hot water, their natural color may be preserved better and longer than without such treatment, still, after a certain length of time, the colors begin to fade and to darken. This is especially the case with succulent plants, as orchids, pinguicula, etc., which assume, during the tedious drying process, a blackish color, in consequence of the partial decomposition or fermentation of the sap. M. Stoelzl has found that the addition of a small quantity of salicylic acid to alcohol produces a liquid possessing superior preservative powers to any other. One part of salicylic acid is dissolved in 600 parts

of alcohol, and the solution heated to boiling in an evaporating dish; the whole plant is slowly drawn through it—a prolonged immersion discolors violet flowers—then swung about to remove the excess of liquid, dried between blotting-paper, and pressed in the usual manner. A frequent renewal of the blotting material, particularly at first, is indispensable. Plants treated in this manner dry rapidly, and furnish specimens of superior beauty, retaining their natural colors in greater perfection than by any other process. New Rem., Nov. 1876, p. 327, from Arch. d. Ph., Sept. 1876, p. 254.

AQUÆ MEDICATÆ.

Wm. Wesley Trout has examined the various methods proposed for the preparation of medicated waters, and gives preference to those prepared by distillation. When this process is not practicable, the "hot water process" is considered the best, yielding a pure and strong water. Very acceptable waters may be obtained by using the elæosacchara of the European pharmacopœias, which, for this purpose, the author proposes to prepare by using 15 minims of the oil to 3 drachms of sugar, triturating them together, and then adding a pint of distilled water gradually, with constant stirring. (The liability of such a preparation to acquire acidity, and to undergo fermentive change, is an objection to this process, however perfect the fresh preparation may be.—Rep.) Purified animal charcoal used with the oil also yields good water. Paper pulp yielded the weakest waters. A. J. Ph., Jan. 1877, p. 4.

Geo. W. Kennedy offers some practical observations on the same subject. After drawing attention to the merits and deficiencies of the various methods of preparing medicated waters that have been prepared from time to time, he gives it as his opinion that the revisors of the next "Pharmacopœia" should require their preparation by distillation from the drug, and should countenance no second process. Next to the method of distillation, the method of adding the oils to boiling water seems to serve an admirable purpose, and to furnish a satisfactory product, but the oils must be fresh, and not in an oxidized condition. Ibid., p. 7.

After trying various methods, C. S. N. Hallberg recommends the following as preferable to all others: Pour boiling water into a strong bottle, or, preferable, a demijohn, drop the requisite amount of oil on a folded filter, and put this filter into the boiling water.

Upon agitation, the filter will be reduced to a pulp, and the oil readily dissolved. After standing a day or two, occasionally shaking it, filter, if necessary, through more pulp. While not so clear as the water made by the magnesia process, the product is unquestionably superior.

Camphor water may be made advantageously by triturating the freshly powdered camphor with the water, gradually added, and filtering after several days. A. J. Ph., Aug. 1876, p. 340.

Cherry-laurel Water, Artificial Preparation.—According to A. Ripping, of Rotterdam, artificial cherry-laurel water, resembling in odor and composition that obtained by the distillation of the leaves, may be prepared by dissolving 6 grams of oil of cherry-laurel and 4.5 grams of cyanide of potassium in one-half litre of water, and distilling over a direct fire from a tubulated retort, a current of carbonic acid gas being passed through it at the same time. (The distillate is afterwards diluted with distilled water, so as to contain one-tenth of one per cent. HCy.) Thus prepared, it is free from formic acid, and contains variable quantities of ammonium cyanide, like the water obtained from the leaves. If oil of bitter almonds be substituted for the cherry-laurel oil, a preparation very different in odor is obtained. A. J. Ph., June, 1877, p. 315, from Arch. f. Ph. Dic., 1876.

Aqua Eucalypti.—Such a preparation is recommended to be prepared by a commission on "Standard Formulæ" appointed by the Pharm. Society of Paris, by distilling 1 part of dry eucalyptus leaves with water until 4 parts are obtained. New Rem., May, 1877, p. 156, from Rép. de Pharm., 1877, p. 193.

CATAPLASMATA.

Cataplasm of Fucus Crispus.—A sheet of carded wadding is evenly spread out, a concentrated mucilaginous infusion of Irish moss poured on it, and this covered with another sheet of wadding of the same size. By beating lightly with a brush, the jelly is made to penetrate the wadding very evenly, and the whole is exposed to the moderate heat of a drying closet until the water has been expelled, when it resembles a sheet of thick cotton and has acquired no odor. When intended for use, sufficient of the wadding is placed in a large plate and moistened with nearly boiling water, whereby the jelly swells considerably, the saturated solution of the emollient

principles of the fucus remaining inclosed in the wadding. A. J. Ph., May, 1877, p. 235.

Picric Cotton.—P. Vigier has prepared this by dissolving 0.25 gram of picric acid in 25 grams of ether, or of 94 per cent. alcohol, and immersing in this solution 10 grams of clean cotton, taking care that, by moderately pressing in every direction, it is uniformly moistened, after which it requires merely to be dried at a moderate heat. It has recently been employed in some of the French hospitals, for the dressing of wounds, upon the recommendation of Dr. Eug. Curie. A. J. Ph., April, 1877, p. 177; Rép. de Phar., 1876, p. 705.

Phytolacca Poultice.—Oliver P. Hooper states that poke-root, roasted in hot ashes until soft, and then mashed and applied as a poultice, is unrivaled for felons and humors of various kinds. A. J. Ph., 1876, p. 490.

CERATA ET UNGUENTA.

Dispensing Ointments.—Some years ago an English pharmacist proposed that the metal tubes used to hold painters' colors might be used with advantage for dispensing cerates and ointments. In 1874, M. Jacques de May, a Parisian pharmacist, adopted the suggestion, and quite recently Dr. A. Van Harlingen has introduced their use in this country. These soft metal tubes can be supplied of any size, and being filled through the lower open end, the edges are pinched and folded together, making a perfectly tight joint. By unscrewing the metal cap and pinching the tube, the desired quantity of ointment is made to exude, while the balance is completely protected from contact with the air and consequent rancidity. New Rem., June, 1877, p. 171.

Cerate of Cantharides.—A. F. W. Neynaber makes some practical suggestions in regard to this cerate which deserve attention. He considers that the employment of *finely powdered* cantharides, resulting in the more thorough solution of the active principle in the fat, produces a comparatively mild cerate, whilst, if the cantharides is employed in the form of a *coarse powder*, and is incorporated with the cerate at a low temperature, a more effective blistering cerate is formed. In this case the cantharidin will remain in the powdered flies, which, when coming in contact with the skin, will, by absorbing moisture, act directly on the cuticle. The flies should be dried at a temperature of 70°–75° F., so as to

drive off the moisture which might cause the cerate to mould. The author proposes two modifications of the officinal formula, the first being intended for winter, the second for summer use: 1. Melt together 8 ounces of yellow wax, 10 ounces of resin, and 4 ounces of lard, add 3 ounces *oil of turpentine*, strain, allow to cool to 120° F., sift into the strained mixture 12 ounces of coarsely powdered (No. 20–22) Spanish flies, and mix well. 2. This differs in using 2 ounces less of *oil of turpentine*. Drug. Circ., April, 1877, p. 65.

Cantharides Plaster.—A. W. Gerrard proposes the following modification of the formula of the B. Ph.: Cantharides, in fine powder, 6 ounces; Canada balsam, 8 ounces; yellow wax, 5 ounces; lard, 1½ ounce. The wax, lard, and balsam are melted together; the cantharides then added, and allowed to macerate for several hours. The disadvantages of the officinal plaster—its brittleness during the winter months, etc.—are entirely overcome by the proposed modification. The plaster, while sufficiently adherent, is readily removed without tearing the blister. Yearbook of Ph., 1876, p. 570.

Blisters, Method of Lessening the Pain.—Ernest Besnier says that the pain attending blisters may be reduced to a minimum by following this plan: Apply the blister early in the morning; after a few hours—five to ten at the outside—remove it as soon as the epidermis begins to rise slightly. After the plaster is removed the skin may be covered with a piece of bibulous paper thickly coated with cerate or cold cream. The vesication continues almost painlessly, and the patient also avoids the renal troubles which sometimes occur when the blister is left on too long. New Rem., May, 1877, p. 143.

Oxide of Zinc Ointment.—Few officinal formulæ have elicited as much comment as that for preparing this ointment, and yet the subject does not appear to be exhausted. I (in "Drug. Cir.," April, 1877, p. 65) suggest the following modifications, by which a good and smooth ointment may rapidly be made with a minimum of labor: Triturate ℥xxv + ℈ij of oxide of zinc with ℥j troy of oil of sweet almonds on a marble slab by means of an ordinary flat-iron until a smooth mixture is obtained. Then heat a mixture of ℥iij of simple cerate and ℥ix of lard to a temperature of about 100°, and having transferred the ground zinc to a capacious evaporating dish, incorporate, by means of a large and limber spatula, the melted

lard and cerate. When the mass cools sufficiently, add a mixture of ℥iij of lard (cold) and ℥j of tincture of benzoin, the latter of double the pharmacopœial strength. Now triturate until the ointment is perfectly cold.

James Ruan states that the following process will produce a preparation free from all roughness, and unequalled for smoothness: Rub the 80 grains of oxide of zinc with about f℥ss. of water on a tile, with a spatula, into a smooth paste, then incorporate the 400 grains of ointment of benzoin. When large quantities are prepared, the whole may be turned into an evaporating dish, placed on a water-bath, applying a gentle heat to drive off excess of water, and stirring until cool, lastly adding the tincture of benzoin. A. J. Ph. May, 1877, p. 233.

L. C. Hogan finds a method of manipulation, suggested by A. E. Ebert, to yield uniformly satisfactory results: Place the lard in a tin dish over a spirit-lamp or gas-jet, and when *just* melted the oxide of zinc is sifted in through a fine hair-sieve, and intimately incorporated by means of a glass rod or small pestle. The tincture of benzoin is then added and thoroughly mixed. The Pharm. Meh., 1877, p. 67.

Rosin Cerate.—The author also offers some practical suggestions on the proper manipulation for making this cerate. The rosin should be in coarse powder and melted first, the wax next added in small pieces; after it is melted the mixture should be cooled down to 110°–115° F., then add the lard, which will readily melt, after which strain. Ibid., p. 67.

Ung. Hydrargyri.—E. Dannenberg states that the reduction of mercury is readily and rapidly accomplished by the use of a small quantity of olein, from 15 to 20 grains of which to a pound of mercury being sufficient, using for the preliminary trituration about one part of lard to six parts of mercury. Arch. Ph., Sept. 1876, p. 256.

Ungt. Hydrargyri Album.—A. Huber recommends the preparation of this ointment by incorporating the fresh precipitate, still moist, with the necessary quantity of fats. 100 parts of white precipitate are produced from 107 parts of corrosive sublimate. The precipitate is allowed to drain in the filter for twenty-four hours, and will then contain water in proportion of 1 part to 2.5 of precipitate. No provision is recommended for the removal of this water, the ointment being directly incorporated with the moist

precipitate. The suggestion is of value to those who prepare the ointment in considerable quantities, but provision should be made for the subsequent removal of the water. Schw. Wochensch. f. Ph., No. 13, 1877, p. 104.

Ointment of Nitrate of Mercury.—L. Wolff has made numerous experiments with various fatty oils, with a view to determine the best fat for its preparation. Failing to obtain satisfactory results with neutral fats, he tried oleic acid, purified as described in a previous paper (see Oleic Acid), and found this, contrary to his expectation, to answer the purpose admirably. The proportions of mercury and nitric acid being the same as in the officinal formula, he substitutes purified oleic acid for the lard. No particular precautions are necessary in regard to heat, no further than that the oleic acid should be heated to the full extent of a water-bath without pressure, before adding the mercurial solution, and should be kept at that point until all reaction and effervescence has ceased, whereupon it is stirred until cold. The product obtained has a beautiful pale-yellow color, which keeps well and retains a good consistence, which is that of simple cerate. He attributes the success of the operation to the *absence of glycerin*, believing the latter to react with the mercuric salt, which is reduced to the condition of subnitrate, mercurous oxide, and metallic mercury, whilst the glycerin is oxidized. A. J. Ph., April, 1877, p. 162.

Ointment of Chrysophanic Acid.—The very favorable results which have been reported as resulting from the application of "Goa Powder" (see "Proceedings," 1875, p. 213) in the treatment of ringworm and other cutaneous diseases, as well as experiments recently made by Balmano Squire with the drug, induce him to suggest an ointment made with chrysophanic acid, since the latter is the chief component (to the extent of 85 per cent.) of the Goa, Bahia, or Arrarobe powder, as it is commonly called. The author dissolves 2 drachms of chrysophanic acid and 1 ounce of lead in the smallest possible quantity of boiling benzole; when the solution is perfect, transfer it to an evaporating-dish placed in cold water, and briskly stir the solution until it sets firmly. It is then spread out in a thin layer, so that the benzole may evaporate completely. So obtained, it constitutes a beautiful and perfectly smooth ointment, which is not obtainable by simply triturating the chrysophanic acid and lard together. Ph. J. Trans., Dec. 16th, 1876, p. 490.

Referring to the demand for *chrysophanic acid*, which is likely to result if chrysophanic acid ointment should prove an efficient and desirable remedial agent, W. Lander Lindsay draws attention to the common yellow wall lichen—*Physcia parietina*, L.—as an abundant source of the acid, which it contains in great abundance. Indeed this lichen has constituted the usual source to chemists for chrysophanic acid, which is, owing to this source, also called *parietinic acid*. The acid is also a prominent constituent of other lichens, such as *Placodium elegans*, Link, and *Chlorea vulpina*, L. The author gives a condensed account of the present knowledge of the acid, and appends a list of monographs which have referred to the subject. Ph. J. Trans., March 3d, 1877, p. 709.

Chloral Ointments.—An anonymous writer in the "Med. and Surg. Rep." draws attention to the application of chloral for topical purposes in combination with fats, and remarks, that owing to its power to liquefy solid fats, satisfactory preparations cannot be obtained unless due regard is had for this property. It is not advisable to prescribe, for instance, chloral hydrate with lard, simple ointment, or even with simple cerate in very large proportion. With oleum theobromæ it forms an unctuous mass, which furnishes a very creditable preparation dispensed as ointment, but to make from this combination a suppository is almost an impossibility. He finds that equal parts of spermaceti and oleum theobromæ, however, will enable the production of a satisfactory suppository, which may contain as much as 10 to 12 grains of chloral. When deviating from this strength, the proportion of spermaceti must be increased or diminished accordingly. Ph. J. Trans., Feb. 24th, 1877, p. 694.

Ung. Diachylon Hebræ.—This ointment, which according to the "Germ. Pharm." is made by melting lead plaster and incorporating with it an equal part of linseed oil, is made by a modified formula in some of the public hospitals of New York, as follows: Five ounces of lead plaster and four fluid ounces of olive oil are melted together at a gentle heat; the mixture is then stirred until it begins to stiffen, when one fluid drachm of oil of lavender is incorporated with it. A homogeneous ointment is produced, which possesses the advantage over the ointment of the "Germ. Pharm." in keeping well. New Rem., Nov. 1876, p. 350.

Unguentum Phytolaccæ Radicis.—Oliver P. Hooper proposes this preparation, which is made by bruising ℥ij of fresh poke-root until

of a uniform pasty consistence, and mixing this with ℥j of lard. It is recommended for scald head and similar diseases. A. J. Ph., Nov. 1876, p. 490.

Boracic Acid Ointment, Lister's.—R. Boracic acid, 1 part; white wax, 1 part; expressed oil of almonds, 2 parts; paraffin, 2 parts. Melt. Stir thoroughly in a heated mortar till the mass begins to thicken. New Rem., Feb. 1877, p. 62.

Ointment for Burns.—Dr. Bedford Brown recommends an ointment prepared from 2 drachms of iodoform, 1 ounce of spermaceti ointment, 1½ drachm of extract of conium, and 10 drops of carbolic acid, to be spread on fine linen, and to be applied twice daily to the burned surface, the part being then enveloped in oiled silk. No other dressing is required, but in cases where there is great dryness of the surface from destruction of vitality and want of exhalation, the wound, before applying the ointment, should be coated with the common linimentum calcis, which affords a soft and moist dressing, and in nowise interferes with the action of the iodoform, the active ingredient of the ointment. A. J. Ph., Nov. 1876, p. 518.

Camphor Ice.—Thomas J. Covell communicates the following formula for this popular preparation: Melt together on a water or steam dish 20 ounces of white wax and 10 ounces of spermaceti, then add 24 ounces of pressed lard (the portion remaining after the oil is expressed from lard) and 6 ounces of camphor. When the camphor is nearly all dissolved, pour the mixture into suitable moulds. It may be perfumed with oil of bitter almonds. Drug. Circ., March, 1877, p. 53.

CHARTÆ.

Mustard Paper.—Good mustard paper can only be prepared from good mustard flour which has been *entirely* deprived of oil. The least trace thereof remaining in the powder prevents its adhesion to the paper, or causes it to stick to the skin; and, besides, through the gradually developed rancidity of the oil, the paper becomes, after awhile, altogether inert. Mustard paper containing fixed oil communicates a yellow color to petroleum benzin after macerating a few hours and filtering, and in its absence the benzin remains colorless. This is due to the circumstance that the fixed oil of mustard colors its solvents intensely yellow. Good

mustard paper will, when applied, show its effects in forty, or, at the most, sixty seconds. New. Rem., November, 1876, p. 330, from Apoth. Zeit.

CONFECTIONES.

Pasta Gummosa.—Sarrazin recommends a modification of the method of the Ph. Germ., by which the application of heat is entirely avoided, while the manual part of the process is considerably shortened. After beating the egg albumen as required by the Pharmacopœia, it is mixed with the oil-sugar (elæosach. aurant. flor.), and the powdered gum arabic—previously mixed with half its weight of powdered sugar—is then carefully and rapidly mixed with the froth. By repeated stirring for half an hour the gum arabic is completely dissolved, and the remainder of the powdered sugar is then incorporated. The "pasta" thus formed is perfectly homogeneous and white, and only requires to be spread out (in paper trays) and dried. The ingredients are as follows: White of egg, 1000 grams (about 42); dilute acetic acid, 80 to 100 drops; elæosach. aurant. flor., 20 grams; powdered gum arabic, powdered sugar, each 800 grams. Arch. Ph., Nov. 1876, p. 422.

DECOCTA ET INFUSA.

Decoct. Cort. Chinæ fusci, etc.—J. Brœker has determined the relative quantities of alkaloids in decoctions of cinchona bark made with and without the addition of acid, and finds that while with the addition of hydrochloric acid (two drachms to eight ounces decoction) the alkaloids are completely extracted, a considerable proportion remains in the bark when water alone is used. When sulphuric acid is used in place of hydrochloric acid, a somewhat smaller quantity of alkaloids (quinia and cinchonia) is obtained. He recommends cort. chinæ regiæ (crown bark) as the most suitable for preparing the decoction. Arch. Ph., May, 1877, p. 404.

Infusion of Coca.—This is made by infusing ten grams of coca leaves in 1000 grams of boiling water. A. J. Ph., May, 1876, p. 236.

ELIXIRES.

Elix. Aurantii Comp.—In his criticisms on the preparations of the Pharm. Germ., L. Enders recommends the following modification of the formula for elix. aurantii comp.: Dissolve 2 parts each

of carbonate of potassium, extract. gentian., extract. absinthii, extract. trifolii, and extract. cascarillæ, in 30 parts of water; add 10 parts tinctura cinnamomi and 50 parts tinctura aurantii, allow the mixture to settle, and filter. In this modification, alcohol is substituted for wine, and a preparation uniform in alcoholic strength thus obtained. The proportion of alcohol is rather larger in this formula than when the preparation is made with strong sherry wine, but may be further reduced by omitting the tinct. cinnam. and water, and substituting 40 parts of cinnamon water. Arch. Ph., July, 1876, p. 26.

R. Rother suggests the following modification of this preparation: Take of orange-peel, 12 troy ounces; gentian root, wormwood leaf, buck bean, cinnamon bark, cascarilla bark, of each 4 troy ounces; carbonate of potassium, 2 troy ounces; alcohol, water, of each a sufficient quantity. The first four ingredients are in coarse powder, the next two in fine powder; mix these with a pint of a mixture of 1 measure of alcohol and 2 measures of water, pack into a glass percolator, and percolate with the menstruum of the same strength until 8 pints of percolate has passed; to this add the carbonate of potassium, allow the mixture to stand twenty-four hours, and filter. The Pharm., Nov. 1876, pp. 321–323.

Elixir Glycyrrhizæ.—George W. Kennedy gives the following formula for an elixir of liquorice, which, he states, furnishes an excellent preparation, and is suitable for masking nauseous medicines: Moisten ℥ij of the best liquorice root, in coarse powder, with sufficient of a mixture of f℥vj stronger alcohol and f℥vj of water; allow to stand for twelve hours, pack into a percolator, pour on the balance of the mixture, and percolate, with the aid of diluted alcohol, until 12 fluid ounces of percolate are obtained. To this add f℥iv simple syrup, f℥iss. spirit of orange, and ♏viij spirit of cinnamon. The spirit of orange is prepared by dissolving 1 fluid ounce of oil in 15 fluid ounces of stronger alcohol. A. J. Ph., May, 1877, p. 229.

Aromatic Elixir of Liquorice.—Joseph P. Remington submits the following formula for an "aromatic" elixir of liquorice, which, he states, appears to be satisfactory: Take of cinnamon, 6 grams; star anise, 4 grams; coriander, 7 grams; caraway, 7 grams; tonqua, 4 grams; canella, nutmeg, cloves, of each, 2 grams; ammoniacal glycyrrhizin, 40 grams; fresh oil of orange, 2 grams; alcohol, 532 grams; syrup, 1000 grams; water, 475 grams. Mix the

oil of orange with the alcohol and water, and percolate the aromatics (which must be in fine powder) with the mixture, obtaining 1000 grams of percolate by the aid of water. Dissolve the ammoniacal glycyrrhizin in a small quantity of boiling water, and add to the rest after mixing with the syrup. If an agreeable simple elixir is at hand, the ammoniacal glycyrrhizin may be dissolved in it in the proportion of 1 gram to 50 grams of simple elixir. Ibid., 231.

Aromatic Elixir of Rhubarb and Fluid Magnesia.—"Country Chemist" recommends the following formula for this preparation, which, he states, has quite an extensive sale in some sections of the country. ℞. Rhubarb (in coarse powder), ℥iij, grs. 90; sulphate of magnesium, ℥ij, grs. 96; sugar, ℥iv; spir. menth. pip., U. S. P., alcohol, water, āā q. s. Moisten the rhubarb with dilute alcohol and pack in a cylindrical percolator. Percolate with a menstruum of one part alcohol to four parts water, until 2 pints of tincture are obtained. To this add the sulphate of magnesium, sugar, and spirit of peppermint, let it stand in a moderately warm place for twenty-four hours, and filter. New Rem., February, 1877, p. 62.

Elixir of Monobromated Camphor.—Dambier suggests the preparation of an alcoholic syrup of monobromated camphor, which may be flavored to suit the taste, as follows: 40 grams of powdered sugar are dissolved by the aid of heat in 60 grams of 56° alcohol, the solution filtered if necessary, and then 50 centigrams of monobromated camphor are dissolved by the aid of heat in the clear liquor. Ph. J. Trans., February 17th, 1877, p. 676; L'Union Pharm., xxvii, 354.

I. Munday has succeeded in making an elixir of monobromated camphor, containing 1 per cent., and consequently just of double the strength of the above:

Monobromated camphor, ...	30 centigrams.
Alcohol at 90°, ...	12 grams.
Orange-flower water, ...	8 grams.
Glycerin, ...	10 grams.

Mix the liquids together and dissolve the monobromated camphor by the aid of gentle heat. Ph. J. Trans., March 3d, 1877, p. 712.

Elixir of Coca.—Coca leaves, 100 grams; 60 per cent. alcohol, 640 grams; macerate for ten days, express strongly, and mix the

liquid with 400 grams of simple syrup. Filter. A. J. Ph., May, 1877, p. 236.

EMPLASTRA.

Isinglass Plaster.—Take of isinglass 10 parts, dissolve it in a sufficient quantity of hot water to make 120 parts after draining. Take 60 parts of this solution, and by means of a brush spread a sufficient number of coatings on stretched silk (taffeta), which should measure, for every 30 grains of isinglass, 104 centimetres in length by 42 in width (about 40 inches by 16). Each coating should be allowed to dry before applying the next. The remaining 60 parts of this isinglass solution are gradually mixed with 40 parts of alcohol and 1 part of glycerin, and this mixture is brushed over the fabric in the same manner as the previous solution. Finally, the back of the fabric is coated with a sufficient quantity of tincture of benzoin, and the plaster is then well dried and preserved in a dry place. It is lustrous, and when moistened becomes very adhesive to the skin. New Rem., Nov. 1876, p. 349.

ESCHAROTICA.

New Escharotic, Iodized phenol.—Dr. Rob. Battey recommends as a uterine escharotic and alterative a combination of half an ounce of iodine and one ounce of carbolic acid. The combination is effected with gentle heat. It is solid in cool weather. By mixing $1\frac{1}{2}$ ounce of this preparation with one ounce of crystallized carbolic acid and $\frac{1}{4}$ ounce of water a permanently liquid preparation is obtained, which is found serviceable for some purposes. A. J. Ph., March, 1877, p. 134.

Nitrate of Silver Pencils.—The production of very thin cylinders of nitrate of silver is now and then demanded, and may be readily accomplished, according to A. Huber, as follows: The melted nitrate is drawn into a glass tube, of the required calibre, by suction, allowed to cool perfectly, and the tube is then gently and carefully heated over a spirit-lamp in order to soften the surface of the pencil, when it may be removed by the aid of a common knitting-needle. Schw. Wochenschr. f. Ph., No. 13, 1877, p. 103.

Croton Oil Pencils.—Limousin prepares these by melting 1 part oleum theobromæ, 1 part of wax, and 2 parts of croton oil together, and moulding them in the shape of pencils, which are dispensed wrapped in tin-foil. The pencils are used by Dr. La-

dreit de la Charrière for the treatment of tinea tonsurans. The irritant character of the pencils seems to be well preserved by keeping. Ph. Centr. H., No. 22, 1877, p. 178.

Iodoform Pencils.—Gallard recommends these in the treatment of superficial ulceration of the neck of the uterus, by introducing them to the ulcerated part and keeping them in position by means of a plug of cotton. They are made by intimately mixing 10 grams of iodoform with 0.5 gram of gum arabic and with mucilage forming a pill mass, which is to be divided into 10 cylinders of 4 centimetres (about 1½ inch) in length, when they are dried in the air and preserved from the light. A. J. Ph., June, 1877, p. 315, from Union Med., Jan. 1877.

EXTRACTA.

Extracts, New Plan for keeping and dispensing them.—J. C. Wharton suggests that solid extracts be kept made up in pills of various sizes, corresponding to the demands of the prescription counter. The plan, if carried out, would facilitate the dispensing of medicaments very materially; but on the other hand there are many objections to such a plan, which will readily suggest themselves to the reader. A. J. Ph., March, 1877, p. 102.

Extracts of the Pharm. Germ.—L. Enders makes some critical remarks upon the processes for some of the extracts of the Ph. Germ., from which the following is extracted:

Extract. absinthii, as well as the bitter extracts generally, is best made by extracting the substance by boiling water, concentrating the infusion to twice the weight of the original substance, adding an equal volume of alcohol, decanting, filtering, distilling off the alcohol, and concentrating to the proper consistency. The process secures a good extract with greater rapidity and less waste of alcohol than is possible by the officinal processes.

Extr. aconiti is perhaps better made by heating coarsely powdered tubers with the alcohol to boiling, allowing to cool, filtering, etc., in place of macerating eight days, etc. The author believes that by this method a more uniform product is obtained, since the substance is extracted at a uniform temperature, and this is not the case, practically, by the processes of maceration as ordinarily conducted.

Extr. aloes is best prepared by heating the water and aloes, instead of simply macerating and agitating occasionally for forty-eight

hours, etc. The advantage of heating consists in the agglutination of the resinous matter and consequent rapid clarification of the solution, which, by the officinal process, takes a long time. The resinous residue should be washed out with a fresh portion of warm water.

Extr. Belladonnæ.—The officinal process, when followed to the letter, yields a good product. The difficulty of obtaining fresh leaves makes it desirable that the root should be substituted for them in its preparation. The dose of the extract of the root would of course be much smaller than that of the extract at present officinal. The author, referring to the unreliable character of commercial extracts, makes the following remarks, which, owing to their peculiar application to this country, are given verbatim: "How little reliance can be placed on commercial extracts of even apparently genuine quality is proven to me by the confession of an old 'extract-cook,' who secured 'a handsome profit' by mixing cheaper extracts (taraxaci, etc.) with narcotic extracts; the good man found consolation in the statement of the druggist 'that the extracts were designed for the American markets.'" Arch. Ph., July, 1876, pp. 28 and 31.

Extractum Graminis.—According to the Ph. Germ., the aqueous extraction of the root is evaporated to the consistence of honey, again dissolved in water, filtered, and evaporated to the proper consistence. E. Dannenberg has observed that when the infusion is evaporated to about one and a half times the weight of the root used, a period is reached during which the impurities settle readily in the form of flakes, and the liquid may then be readily filtered through a felt or paper filter. This period is recognized by taking out samples of the evaporating liquid and holding it towards the light in a test-tube. If the filtration is attempted before the formation of the flocculent precipitate, or after that period, it proceeds with great difficulty. Arch. Ph., Sept. 1876, p. 257.

Extract of Nux Vomica.—L. Wolff recommends petroleum benzin for the removal of the fixed oil from the powdered seeds before extracting them with alcohol. The extraction by alcohol is then much easier, and the tincture obtained can at once be concentrated to powdery dryness. As a precaution against loss of active constituents (alkaloids), the author recommends that the fixed oil remaining after the evaporation of the benzin be repeatedly shaken with diluted alcohol as long as the washings acquire bitter-

ness, and the washings, after proper concentration, be mixed with the alcoholic tincture. A. J. Ph., Jan. 1877, p. 3.

Extract Colocynth. Comp.—Olaf Martin Oleson has endeavored to devise a method by which the quality of comp. extr. of colocynth may be approximately determined. The results of his experiments do not establish such a method, but are quite interesting and will serve as a basis for further experiments. The experiments consisted in extracting the components that enter into the composition of the comp. extract separately, by percolations with stronger alcohol, evaporating to dryness, and weighing; then exhausting the alcoholic extract by ether, evaporating and weighing; then the ethereal extract by petroleum benzin, and ascertaining the weight of the amount extracted by this liquid; finally, treating the portion of ethereal extract remaining undissolved by the benzin with solution of potassa, the solution precipitated with HCl, and its quantity ascertained by washing with water, drying, and weighing. The following table gives the results:*

No. 1.

Ten grams of substance.	Substance.	Alcoholic extract.	Ethereal extract.		Portion of ethereal extract insoluble in petroleum benzin.		
	Soluble in stronger alcohol.	Soluble in ether.	Soluble in petroleum benzin.	Insoluble in petroleum benzin.	Soluble in solution of potass.	Precipitated from solution of potass by HCl.	Retained in solution after adding HCl.
Purified aloes, . . .	8.87	0.66	0.26	0.40	0.40		0.04
Extract colocynth, .	6.63	0.81	trace	0.75	0.70		trace
Cardamom, ...	0.72	0.18	0.12	0.06	0.06		trace
Soap, ...	6.00	1.76	0.15	1.55	1.55		
Scammony resin, . .	10.00	10.00		10.00	10.00		10.00

The above quantities *calculated* for ten grams of compound extract of colocynth:

* The author's results are given in three separate tables which have been united in this extract.—Rep.

No. 2.

	Substance.	Alcoholic extract.	Ethereal extract.		Portion of ethereal extract insoluble in petroleum benzin.		
	Soluble in stronger alcohol.	Soluble in ether.	Soluble in petroleum benzin.	Insoluble in petroleum benzin.	Soluble in solution of potass.	Precipitated from solution of potass by HCl.	Retained in solution after adding HCl.
Purified aloes, . . .	4.63	0.34	0.14		0.21		0.02
Extract colocynth, .	1.01	0.12	trace		0.11		trace
Cardamom, ...	0.05	0.01	0.01		trace		trace
Soap, ...	0.79	0.23	0.02		0.20		
Scammony resin, . .	1.30	1.30			1.30		1.30
Total, . .	7.78	2.00	0.17		1.82		1.32

Ten grams compound extract colocynth:

No. 3.

	Substance.	Alcoholic extract.	Ethereal extract.		Portion of ethereal extract insoluble in petroleum benzin.		
	Soluble in stronger alcohol.	Soluble in ether.	Soluble in petroleum benzin.	Insoluble in petroleum benzin.	Soluble in solution of potass.	Precipitated from solution of potass by HCl.	Retained in solution after adding HCl.
Theoretical yield, . .	7.78	2.00	0.17	1.83		0.51	1.32
Own make, ...	7.11	4.12	0.90	3 00		0.45	2.55
Manufacturer, . . .	7.70	4.35	1.00	3.25		1.12	2.13

On comparing the results in table No. 3, it will be seen that the theoretical results do not correspond with those practically obtained. It will be found that the ether dissolved twiee as much when the substances were mixed than when they were treated separately, and this was again verified by direct experiment. The petroleum benzin as well as the solution of potassa dissolved more of the comp. extract of colocynth than it did of its separate com-

ponents, while the dilute muriatic acid did not throw down as much precipitate as was calculated from the amount of scammony resin, which was expected to be the only principle remaining in solution. It is inferred from this that there is something else in the extract besides the resin of scammony that is soluble in solution of potassa and not precipitated by muriatic acid.

The author endeavored to separate from the compound extract the aloes, soap, and part of the extract of colocynth, by treating it with water, but he found that nearly all the compound extract was dissolved, and believes this to be due to the solvent action of the soap. A. J. Ph., April, 1877, p. 178.

Extract of Malt.—R. V. Mattison communicates his experience in the preparation of extract of malt. He states that the malt should be preferably that made from barley grown in high latitudes, like Michigan, Canada, etc.; such barley containing more starch than others. The barley must be carefully malted, so as to insure the largest possible quantity of diastase. The coarsely ground malt must be carefully *mashed*, with due regard to the temperature, so as to insure the largest amount of sugar being extracted with the smallest amount of water. To this end, fourteen gallons of water, of a temperature of from 168° to 172° F., are placed in a tub, preferably of cedar, with a perforated false bottom, and about twenty gallons capacity. A half bushel of ground malt is then added, little by little, and well stirred in. The tub is then well covered, and allowed to stand in a warm room for three or four hours, taking care that the temperature does not fall below 150° F. The *wort* is now ready to be drawn off by a stopcock beneath the perforated diaphragm, the residual malt being washed by sprinkling water of a little higher temperature than the extract upon it, until the liquor passes of a very low specific gravity, and the malt is practically exhausted. The wort is then evaporated to the proper consistence in suitable vessels in a water-bath, and at as low a temperature as possible. The most scrupulous cleanliness must be observed at all times in and about all the vessels and utensils used; the vessels should be washed at least once a week with dilute caustic potash or soda solution, and when not in use the wooden vessels should be kept filled with lime-water.

Extract of malt and iron is prepared by adding to the simple extract a syrupy solution of pyrophosphate of iron in proportion of four grains to the tablespoonful.

Extract of malt with cod-liver oil may be made so as to contain fifty per cent. of cod-liver oil. The oil and malt mix readily so as to form an emulsion, and produce a very palatable and acceptable preparation, which, indeed, the author considers the acme of all emulsions of cod-liver oil. A. J. Ph., December, 1876, p. 531.

Extract of Coca.—This preparation is made by displacing coca leaves with sixty per cent. alcohol, and evaporating to a soft extract. A. J. Ph., May, 1877, p. 236.

Extract of Hyoscyamus.—R. Huguet observed in an old extract a large number of crystals, the principal form of which was the regular octahedron, in some cases with the combination of the cube. By incineration he obtained between 22.28 and 31.5 per cent. of fixed residue, containing from 5.12 to 8.4 per cent. of chloride of potassium. A. J. Ph., January, 1877, p. 9; Rép. de Phar., 1876, p. 545.

EXTRACTA FLUIDA.

Non-alcoholic Fluid Extracts, Preparation by Insuccation.—Henry Biroth attributes the indisposition of pharmacists to prepare fluid extracts to three principal causes: 1. The inconvenience of reducing the drug to the necessary degree of fineness. 2. The expense of preparing them on a small scale. 3. To the care and attention necessary, which cannot be devoted in all pharmacies. He has given the subject of an improved method much thought and has devoted much time to experiments, which prompt him to recommend a process in which alcohol is entirely dispensed with, in which there is no necessity for powdering the drug, which requires no special attention, and which is applicable for the extraction of many of the drugs now used in the form of fluid extracts. The following formula illustrates his process:

Fluid Extract of Dandelion.

Take of Dandelion root, cut or crushed, . .	16 troy ounces.
Glycerin, ...	8 fluid "
Boiling water, ...	8 pints.

Mix the glycerin with 4 pints of boiling water; pour upon the dandelion root and allow to insuccate for 24 hours, then strain, allow to settle, and decant. Upon the residue pour 4 pints more of boiling water and proceed as before. Mix both decanted liquors, evaporate by means of a water-bath, and filter. The insuccation can be done either in a stone jar, or more practically in a tin per-

colator. It is essential that the drugs should not be in a powder, not even ground, as then the gummy, starchy, and pectic substances are much more easily dissolved, and form the greatest obstruction on filtering. Gentian, rhatany, and ergot are extracted with cold water; liquorice with cold water to which ammonia water is added, one ounce for each pound of the crude drug; buckthorn bark, rhubarb, seneka, and senna are first treated with boiling water and next with cold water and ammonia. The solvent power of glycerin is well known. In the first insuccation it acts as an assistant of the water in loosening the ligneous fibre and dissolving the active principles. Its power as a solvent, though not so great as that of alcohol, should not be underestimated. The second insuccation includes the entire extraction of the glycerin, as it is necessary that no glycerin should be wasted. In the course of the evaporation the solvent action of the glycerin is again noticed, the liquid becoming clearer as it becomes more concentrated. The finished fluid extract contains fifty per cent. of glycerin, which is sufficient to keep the organic substances in solution and to preserve them. In the author's opinion the free use of glycerin in this class of preparations, to which objection has been made, is perfectly justified. The various galenical preparations made from these fluid extracts—decoctions, infusions, syrups—are characterized by clearness and freedom from deposits. The use of ammonia in certain fluid extracts is of no small importance. The menstruum is made softer by it, resinous matter is dissolved to a certain degree, the ligneous fibre is more readily loosened, and active principles enter into soluble alkaline combinations. All excess of ammonia, if any, is driven off during evaporation. Care should be taken to add ammonia only to cold liquors, as it has the property of converting starchy matter into a more soluble form when the liquors are hot. The Pharm., April, 1877, pp. 97–99.

Fluid Extracts, Specific Gravity.—G. H. Klie has determined the specific gravity of quite a number of fluid extracts, and believes that by such determinations a criterion of strength may be obtained. The value of such determinations is not very obvious, in so far as extreme differences may be shown. To illustrate: the author gives the sp. gr. of the alcohol with which the fluid extract of buchu, cimicifuga, cubebs, serpentaria, valerian, etc., are made by him to be 0.825. Specific gravity in this case serves a very good purpose, since it informs us that the alcohol used was, in the case of the fluid extract of buchu and serpentaria, too strong,

whilst for cimicifuga, cubebs, and valerian, it was too weak. But when he states the sp. gr. of fluid extract of buchu to be 0.895, we may accept this for the particular preparation he has examined, but it gives us no criterion of strength. A. J. Ph., Dec. 1876, p. 531.

Fluid Extracts, Variation of some Commercial Samples—Clayton K. Smith has made some comparative experiments which illustrate very forcibly the variation of commercial fluid extracts. Four fluid ounces of each of the samples were evaporated to a pilular consistence, and the residue then weighed, with the following results:

	1.	2.	3.	4.	5.	6.
Ext. Gentianæ fluid.,	360 grs.	800 grs.	1070 grs.	720 grs.	1440 grs.	850 grs.
" Sennæ "	840 "	1010 "	720 "	540 "	1380 "	825 "
" Rhei "	480 "	1235 "	1210 "	960 "	1500 "	800 "
" Scillæ "	1000 "	1068 "	1300 "	800 "	1680 "	1080 "
" Ergotæ "	480 "	420 "	550 "	400 "	780 "	780 "

A. J. Ph., Jan. 1877, p. 5.

Fluid Extract of Ipecac.—H. C. Watts has found that fluid extract of ipecac, made by exhausting the root by the U. S. P. process, throwing the percolate into four times its bulk of water, filtering, allowing to stand twenty-four hours, again filtering, adding the necessary quantity of glycerin, and evaporating to the proper bulk, will, when mixed with the proper quantity of syrup, form a perfectly transparent syrup, which is free from sediment of any kind. Fluid extracts made by other methods did not yield satisfactory syrups. A. J. Ph., Aug. 1876, p. 337.

Fluid Extract of Senna.—A. F. W. Neynaber recommends the following modification of the officinal formula, which furnishes a clear, efficient, and permanent preparation: Moisten and pack 16 troy ounces of senna (in powder No. 16) with a menstruum composed of 1 measure of alcohol and 4 measures of water; percolate very slowly (drop by drop) until the senna is exhausted, add 2 fluid ounces of glycerin, evaporate to 13 fluid ounces, and finish by adding 3 fluid ounces of alcohol. The author considers that this nearly approaches an aqueous fluid extract, and that it is superior to the hydro-alcoholic preparation of the U. S. Ph. Drug. Cir., Jan. 1877, p. 18.

Liquid Extract of Pareira, B. P.—B. S. Proctor draws attention to the importance of reducing the pareira root to a fine condition

before its extraction with water. Several commercial samples of liquid extract were found by him very inferior, and he is inclined to the opinion that this is mainly due to incomplete exhaustion of coarsely powdered root. In experiments made by him, he employed fine powder (passed through a sieve of 120 wires to the linear inch). 1 pound of the powder was mixed with 1 pint of boiling water, but instead of digesting, as required by the B. P., the mixture was allowed to become cold, and it was then percolated with boiling water. He found that pareira root, when thoroughly exhausted, yielded 17 per cent. of dry extract, or 25 per cent. of soft pilular extract. The first three pints of percolate, from 1 pound of finely powdered root, while representing the greater part of the extractive constituents of the root, did by no means thoroughly exhaust it. On continuing the percolation to 5 additional pints, it was found that these contained about one-fifth as much extractive substance as was contained in the first 3 pints. He suggests that the liquid extract might be profitably made by distilling 4 ounces of a soft extract in 3 fluid ounces of rectified spirit, and sufficient water to make 16 fluid ounces. Yearbook of Ph., 1876, p. 488.

Fluid Extract of Cotton-root Bark.—Walter A. Taylor has experimented on this preparation with results similar to those recorded in previous reports. He finds that when a fluid extract is made from bark collected in July or August—six or eight weeks before the picking season—using stronger alcohol as a menstruum, the resulting preparation is of a pale-yellow color, but on standing becomes gradually a beautiful red, which color it has retained for six months without producing any deposit. When made with dilute alcohol, it underwent the same change of color, but forms a precipitate in three or four weeks. A. J. Ph., Sept. 1876, p. 402.

Fluid Extract of Hydrangea Arborescens.—Dr. John King communicates the following formula for its preparation: Hydrangea root, in fine powder, ℥xvj; alcohol, diluted alcohol, of each a sufficiency. Moisten the powder with alcohol; after twenty-four hours pack it into a percolator, and add enough alcohol to obtain twelve ounces of percolate, and set it aside. Then add diluted alcohol until the root is exhausted, evaporate this to four fluid ounces, and add it to the twelve ounces first obtained, so as to make one pint of fluid extract. New Rem., Nov. 1876, p. 349, from Med. and Surg. Rep.

GLYCERITA.

Glycerite of Lime.—Carles has observed that the addition of glycerin increases the solubility of lime in water. A litre of distilled water is capable of dissolving 1.25 grams of lime. Upon the addition of 100 grams of glycerin it will dissolve double the quantity (3.58 grams), and if 200 grams of glycerin are added, the solubility of the lime is much greater. A further addition of glycerin seems, however, to diminish the solubility of the lime, and this is explained by the assumption that a compound of glycerin and lime is formed which is readily dissolved by water, but is only sparingly soluble in glycerin.

Laub has used a solution of lime in glycerin, prepared as follows: Dissolve 3.0 of freshly burned lime in 150.0 of pure glycerin by the aid of a gentle heat, allow the solution to cool, and add 3.0 of chloric ether. Independent of its applicability as a substitute for saccharate of lime in acidimetric experiments, glycerite of lime furnishes an excellent adjuvant for preparing lime liniment; a 10 per cent. solution of the glycerite in water, used in lieu of lime-water for preparing the liniment forming a decidedly superior preparation, since it remains homogeneous for a longer period, and is not so liable to become rancid as the liniment made with lime-water. Ph. Centr. H., July 13th, 1876, p. 241.

Glycerole of Saccharate of Calcium.—The following formula has been reported for adoption to the Pharmaceutical Society of Paris by a commission on "Standard Formulas:" Burnt lime, clean and white, 80 grams; powdered sugar, 160 grams; glycerin, 160 grams; water, q. s. to make 1 litre. To the lime and sugar add gradually, and in small portions, 700 grams of water. After twenty-four hours' contact, filter, add the glycerin and sufficient water to make 1 litre. New Rem., April, 1877, p. 126, from Rép. de. Pharm., Nos. 2 and 3, 1877.

Glycerole of Nitrate of Bismuth.—Dr. Balmano Squire finds that nitrate of bismuth is readily dissolved by glycerin, forming a solution which he regards as very useful for topical as well as internal application. He does not propose a definite strength of the preparation, leaving the further development of the idea to pharmacists. A. J. Ph., January, 1877, p. 23; Ph. J. Trans., November 11th, 1876.

At a meeting of the Pharmaceutical Society of Great Britain, held December 6th, 1876, Dr. Squire's suggestion seems to have

borne fruit. J. Williams finds that a solution of 20 per cent. of crystallized nitrate of bismuth in glycerin may be made, and that it is best effected in the cold; if too much heat is employed the glycerol, when diluted with water, will make a milky solution, at any rate, after a few hours. The property of bearing dilution with water, without producing a turbid solution, appears to diminish by keeping. The solution does not bear boiling, but when so treated deposits a basic salt, not afterwards soluble in water. The most interesting reaction is, that caustic potassa or soda added to the solution, diluted with water, causes a white precipitate which is perfectly soluble in the alkalies, but not in ammonia, the solution being miscible in all proportions with water, but not with alcohol. The latter produces a precipitate which is not again dissolved by water. A. J. Ph., February, 1877, p. 89.

W. W. Moorhead has also experimented with this glycerol, which, in conformity with our Pharmacopœia, he calls glycerite. He prepares it by dissolving two troy ounces of the nitrate in sufficient glycerin to make eight fluid ounces. He finds that the glycerin can be diluted with a small quantity of water (an equal bulk or less), and yet retain all the bismuth in permanent solution. If more than three parts of water are added to one part of the glycerite a portion of the bismuth will be slowly deposited, the time elapsing before the precipitation will commence depending on the degree of dilution. One part of glycerite diluted with twelve parts of water commences to precipitate in two hours; diluted with eight parts, in four hours; diluted with six parts, in twenty-four hours, but in very dilute solutions, as one part to forty-eight parts of water, the precipitation is quite slow, no signs of precipitation appearing before two days.

Incidentally, the author suggests that the glycerites of the Pharmacopœia, with the exception of glycerite of tar, should be made to measure eight fluid ounces, instead of adding eight fluid ounces to the qualifying ingredient. Ibid., March, 1877, p. 98.

Referring to the preparation proposed by B. Squire, John Williams communicates some observations on its preparation and properties. He finds that the solution of the crystallized nitrate of bismuth is best effected in the cold; if much heat is employed it will subsequently form a turbid solution when diluted with water; this property of bearing dilution with water without producing a turbid solution appears to diminish on keeping; the diluted solution cannot be boiled without becoming turbid, and the basic salt

formed, to which the turbidity is due, is not afterwards soluble in water. The most interesting reaction observed is, that caustic potash (or soda) added to the glycerite diluted with water first causes a white precipitate which is perfectly soluble in excess of alkali. Ammonia will not redissolve the precipitate formed. The alkaline solution may be diluted to any extent with water without change, but the addition of alcohol causes a white precipitate which is afterwards insoluble. The author appears to be of the opinion that glycerin is capable of forming a regular compound with the nitrate of bismuth. Ph. J. Trans., December 9th, 1876, p. 470.

W. Willmott has also experimented upon this preparation, chiefly with a view to determine the most advantageous strength of the glycerol in reference to its subsequent admixture with water. As a result of his experiments he suggests the following formula: Nitrate of bismuth, ℥ss.; distilled water, ℥ij; Price's glycerin, ad ℥ij; dissolve the nitrate of bismuth in f℥ij of glycerin previously mixed with the water; then add the solution to the remainder of the glycerin, and mix well together. The effect of heat upon the preparation is also considered, and indicates that no heat should be employed in its preparation. The author also points out some of its reactions. Ph. J. Trans., April 14th, 1877, p. 830.

Glycerole of Subnitrate of Bismuth.—A formula for a preparation so named is given in "New Remedies" (June, 1877, p. 189). The preparation is simply a mixture, and must not be confounded with the above preparation of Mr. B. Squire. It is as follows: Glycerole of starch 90 grams, *subnitrate* of bismuth 10 grams; mix carefully without heat. (From Rép. de Pharm.?)

Glycerole of Salicin.—A. W. Postans suggests a solution of salicin in glycerin, which may be made by rubbing together salicin and glycerin, in the proportion of 5 grains of the former to f℥j of the latter, and then heating gently until solution is effected. He also offers a formula for a combination of salicin with glycerinized pepsin, which he names:

Glycerole of Pepsin and Salicin.—To obtain this, the fresh stomach of the pig is washed in water until all particles of food are removed, and, the cardiac end being rejected, it is cut into slips and digested for a week in as much glycerin as will entirely cover it, then strained and filtered. The solution is about the consistence of simple syrup, of a pale cherry color, has a sweet taste, and

the characteristic flavor of pepsin. Equal portions of this and the above-named glycerole of salicin constitute the glycerole of pepsin and salicin. Ph. J. Trans., April 21st, 1877, p. 850.

LINIMENTA.

Soap Liniment.—C. S. N. Hallberg recommends the following improved formula: Castile soap, 4 troy ounces; water, 14 fluid ounces; camphor, 2 troy ounces; oil rosemary, ½ fluid ounce; strong alcohol, 1½ pint. The water is mixed with ½ pint of alcohol, and poured upon the soap, which, by occasional agitation, will dissolve in a short time. A solution of the camphor and oil in the remaining alcohol is then added, and the preparation filtered. Its alcoholic strength is less than that of the officinal preparation. A. J. Ph., Aug. 1876, p. 340.

Cream of Camphor.—Charles Griffin offers a formula, which appears to be a modification of that given by Otto Kraus (see Proceedings, 1875, p. 72). ℥iss. of castile soap, in shavings, is dissolved in f℥vj of water, previously mixed with f℥ij of water of ammonia; the solution is well mixed with a solution of ℥iss. of chloride of ammonium in f℥vj of water, and a solution of ℥vj of camphor in f℥vj of oil of turpentine is then added, with brisk agitation in order to secure a perfect emulsion. A. J. Ph., November, 1876, p. 490.

Liniment of Saccharate of Calcium is prepared according to the formula approved by a commission on "Standard Formulas" of the Pharmaceutical Society of Paris, by mixing 200 parts of olive oil with 100 parts of glycerole of saccharate of calcium (which see). New Rem., April, 1877, p. 126; from Rép. de Pharm., Nos. II and III, 1877.

Alkaline Liniment for Rheumatism.—Dr. I. W. Futrell recommends a liniment, prepared as follows: Olive oil, ℥v; chloroform, ℥ij; hartshorn, ℥vj; tincture of aconite root, ℥ij. M. This is applied to inflamed joints sufficiently often to relieve pain, bromide of potassium being given at night to secure rest. New Rem., Sept. 1876, p. 269.

Liniment of Iodide of Ammonium.—Theodore G. Davis has analyzed "Giles's Liniment of Iodide of Ammonia," and finds that the following formula very closely represents that preparation: Iodide of ammonium, grs. ij; camphor, oil of lavender, āā ℥j; water of ammonia, ℥iv; alcohol, sufficient to make Oj.

He recommends, however, a liniment made as follows: Water of ammonia, f℥iij; glycerin, or (as he prefers) soap liniment, f℥ij; tincture of iodine, f℥viij; alcohol, q. s. Mix the soap liniment (or glycerin) with the tincture of iodine, and f℥iv of alcohol and the ammonia water, shake, and make to 1 pint in the alcohol. A. J. Ph., June, 1877, p. 304.

LIQUORES.

Solution of Acetate of Ammonium.—R. H. Bernhardt finds that solution of acetate of ammonium, prepared by saturating dilute acetic acid with ammonia water, keeps better than when it is made by the officinal method. He is of the opinion that the presence of carbonic acid impairs its stability, as does also exposure to 80° to 90° F., the average temperature of the stores. In the modified process of the author, the acetic acid is diluted to seven-eighths of the required volume, is then accurately saturated with ammonia water (or allowed to react faintly acid), and is then brought to the proper measure with water.* Druggist's Circ., July, 1876, p. 118.

Solution of Chlorinated Soda.—If chlorinated lime is decomposed by a solution of carbonate of sodium, the precipitate remains suspended, and a clear liquid is with difficulty obtained by decantation. By the use of bicarbonate of sodium a crystalline precipitate of carbonate of calcium is formed, which readily subsides; a slight excess of the bicarbonate is rather advantageous. A. J. Ph., April, 1877, p. 176; Apoth. Zeit., 1876, No. 31.

Phenol-sodium.—The following formula has been reported by a commission on "Standard Formulas," by the Pharm. Society of Paris: Carbolic acid, 70 grams; caustic soda, 30 grams; water, q. s. to make 1 litre. New Rem., May, 1877, p. 156; from Rép. de Ph., 1877, 193.

Carbolate of Iodine, Inhalant of Dr. Percy Boulton.—L. C. Hogan communicates the following formula: Comp. tincture of iodine, f℥j; carbolic acid, ♏vj; glycerin, f℥j; water, f℥v. Mix. The solution soon loses its iodine color, becoming clear and colorless. The Pharm., Oct. 1876, p. 290.

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* It is quite as satisfactory, and preferable on some accounts, to saturate the officinal acetic acid with carbonate of ammonium and, keeping record of the increase in volume, diluting the concentrated and filtered solution in such quantities as may be desirable. The concentrated solution appears to keep perfectly.—Rep.

Solution of Citrate of Magnesium.—One would suppose that the improvements on this preparation should be about exhausted, more especially since it seems to be generally conceded that the officinal process will give uniformly good results. Indeed, the process for solution of citrate of magnesium is one of the few good processes of our last Pharmacopœia. But the subject is not yet exhausted, and, probably, never will be. J. W. Watts gives a process by which he claims that the preparation can be made in from three to four minutes; indeed, while the patient is waiting for it. It is as follows: Dissolve 450 grains of citric acid in 4 fluid ounces of boiling water, and while hot add 120 grains of magnesia, constantly stirring until dissolved; decant the clear liquid from any gritty sediment that may remain; then add 2 fluid ounces of syrup of citric acid, and add sufficient cold water to fill a 12-ounce bottle; lastly, add 40 grains of bicarbonate of potassium, and cork. It now only remains for some one to recommend the use of *boiling water* altogether, and to direct the patient to drink the potion hot—something like hot soda water, being perhaps more effective. A. J. Ph., March, 1877, p. 99.

The Territory of Dakota also contributes its mite to this all-important question. Joseph Rhinehart proposes a

Substitute for Solution of Citrate of Magnesium.—It is prepared with the following ingredients: Citric acid, ℥j; sulphate of magnesium, ℥ss. to ℥j; simple syrup, f℥iij; essence of lemon, ♏v; bicarbonate of potassium, gr. xl; pure water, sufficient to make f℥xij.

"The above formula is much cheaper, and contains in a greater degree the required properties of a good, mild laxative than does the officinal solution of magnesium citrate, and also has a very pleasant favor, the bitter taste of magnesia being entirely absent." Ibid., p. 100.

W. Wesley, referring to the method suggested by Watts, gives his method of preparing a solution of citrate of magnesia. Ibid., April, 1877, p. 161.

Ferrum Dialysatum.—In reply to a correspondent, the editor of Notes, Queries, etc., in "New Remedies" (Feb. 1877, p. 57), gives Dr. Hager's directions for preparing this compound, which is also called

Liquor Ferri Peroxychloridi, or Liquor Ferri Subchloridi.—Dilute 10 parts of solution of ferric chloride with cold water, pre-

cipitate it with dilute (1 : 10) water of ammonia, wash the precipitate with cold water, and add it while still moist to 11 parts of solution of ferric chloride contained in a sufficiently capacious flask. Put it aside for one day, frequently agitating, until the ferric oxide is dissolved. Filter if necessary, transfer the solution to a parchment dialyser, which must be filled so that the surrounding water reaches to one-third of the height of the within-contained solution. Set the apparatus aside in a cold place for about 10 days, and remove the outer liquid occasionally, replacing it by pure water. As soon as a small sample of the solution removed from the dialyser ceases to produce a cloudiness with nitrate of silver, the solution is poured out into a beaker, and its specific gravity taken, which should be 1045 to 1046; if found to be too dilute, it must be concentrated by evaporation; otherwise it must be diluted. 100 parts of the solution should contain 5 per cent. of anhydrous ferric oxide. If evaporation is required it must be conducted very carefully, by heating a portion of the solution in a shallow capsule on the water-bath at a temperature not exceeding 60° to 70° C. (= 140° to 158° F.), stirring constantly with a glass rod, and preserving the original height of the liquid by the gradual addition of more of the solution. The following table will facilitate the calculation and adjustment of the strength of the liquor:

Spec. gr.	P. c. Fe_2O_3.	Spec. gr.	P. c. Fe_2O_3.	Spec. gr.	P. c. Fe_2O_3.
1102	10.0	1063	6.5	1027	3.0
1096	9.5	1057	6.0	1022	2.5
1091	9.0	1052	5 5	1018	2.0
1085	8.5	1046	5.0	1014	1.5
1079	8.0	1041	4.5	1009	1.0
1074	7.5	1036	4.0	1004	0.5
1068	7.0	1031	3.5		

The solution has an intense reddish-brown color, a slightly styptic taste, and must be kept in glass-stoppered vials in a cool and dark place. During its preparation daylight and heat must be avoided as much as possible.

A less circumstantial process, which, however, yields a less pure product, is the following: Dilute 85 parts of solution of ferric chloride with 800 parts of cold distilled water, precipitate it with dilute (1 : 10) water of ammonia, collect the precipitate on a strainer, squeeze it, wash it as quickly as possible with cold distilled water, and transfer it into a large flask containing 10 parts of solution of

ferric chloride diluted with 40 parts of distilled water. Set aside in a cold place for a few days, and shake frequently. Then add to it moist hydrated sesquioxide of iron, prepared as before stated, from 23 parts of solution of ferric chloride, set aside for 3 or 4 days, occasionally agitating. Dilute the solution with water, so that after filtering it amounts to 520 to 525 parts. If too dilute it must be carefully evaporated to that weight. This solution has the same specific gravity and percentage as the first-mentioned one.*

Dialysed Iron.—The following formula is given in "New Remedies," June, 1877, p. 188: Solution of ferric chloride (sesquichloridi), sp. gr. 1261, 100 grains; water of ammonia, sp. gr. 0.923, 35 grains. Add the latter gradually to the former. The precipitate formed is redissolved at first rapidly, then more slowly, but finally it is again entirely redissolved, and the solution is now transferred to a dialyser, the water surrounding which must be frequently removed. After awhile, the highly colored ferruginous solution ceases to precipitate nitrate of silver or to have an acid reaction. It has also lost its characteristic taste of iron. 10 c.c. of the product are evaporated to dryness to ascertain the percentage of ferric oxide, and the remaining solution is diluted with water until the final product contains 10 per cent. (? Rep.) of ferric oxide. (From Rep. de Pharm.?)

Liquor Ferri Peroxychlorati, Cause of gelatinizing.—Oltmans, who has prepared dialysed iron on an extensive scale for a number of years, finds that the gelatinization of its solution is due to an excess of oxide of iron. If the hydrated oxide of iron is added to the solution of chloride of iron until nitrate of silver ceases to give a reaction for chloride, the product is not liable to gelatinize; but if its addition be continued after that point, gelatinization will readily occur. Such supersaturated solutions are, moreover, very liable to undergo decomposition. Gelatinized solutions may be restored by the addition of chloride of iron, observing that the latter be not added in excess, *i. e.*, that silver solutions do not react. Ph. Centr. H., Oct. 5th, 1876, p. 345.

Ferrum Catalyticum.—Under this name, Dr. Wagner, of Buda-Pest, has introduced a preparation of ferric oxide, which he recommends as a substitute, and by preference, to dialysed iron. This

* The solution of ferric chloride necessary for the second process is evidently the liquor ferric sesquichlorati, Ph. Germ.—Rep.

latter preparation was also first brought to notice by Dr. Wagner, but while he published the method of producing dialysed iron, he has failed so far to give that for producing "catalytic iron." Dr. Hager has subjected a sample of Dr. Wagner's catalytic iron to examination, and pronounces it a very dilute solution of peroxychloride of iron (ferrum dialysatum), which in no way, except in that it is not so strong, appears to differ from the dialysed iron prepared by Hager's method.* Ph. Centr. H., No. 52, 1876, p. 341.

Solution of Sesquichloride of Iron.—John P. Pignett suggests a modification of the officinal method of preparing this solution, whereby he secures a product which contains the requisite quantity of perchloride of iron, and is entirely free from nitric acid and protochloride. 1300 grains of iron, in form of wire or card-teeth, are introduced into a flask with 12 fluid ounces of boiling distilled water. Mix 11 troy ounces of muriatic acid, sp. gr. 1.16, or its equivalent of acid available, with $1\frac{1}{2}$ troy ounce of nitric acid, sp. gr. 1.42, or its equivalent in weaker acid, and add the mixture, in successive portions of 1 or 2 fluid ounces, to the card-teeth and water—always ceasing to add if the evolution of nitrous acid gas becomes copious—until all is added. Set the flask aside in a warm place until the iron is completely dissolved, which will be in twenty-four or thirty hours from the time of commencing the operation. Heat the solution, in a sufficiently large evaporating-dish, to the boiling-point, pour in $5\frac{1}{2}$ troy ounces of muriatic acid, sp. gr. 1.16, or its equivalent, and nitric acid $1\frac{1}{2}$ fluid ounce, or sufficient to perchloridize all the iron in solution. Then evaporate or boil down the solution to 6 fluid ounces, or even less if necessary to free it from nitric acid, add 1 troy ounce of muriatic acid (sp. gr. 1.16) and sufficient distilled water to make the solution measure 1 pint. Drug. Circ., May, 1877, p. 82.

Normal Solution of Bromide of Iron.—The following formula is given in "New Remedies" (June, 1877, p. 188): Iron filings, 40 grams; distilled water, 216 grams; bromine, 80 grams. To the water, contained in a flask, is first added the bromine, and gradually the iron. Towards the end a gentle heat is applied, until the liquid assumes a fine green color. The whole solution, including the uncombined iron, is immediately transferred to a glass-stop-

* This method appears to be essentially that above given as the shortest method, *i. e.*, that of simply dissolving hydrated ferric oxide in solution of ferric chloride to saturation.—Rep.

pered bottle. As it does not keep long, it is best to be made at once into syrup (which see) or into pills. It contains one-third of its weight of bromide of iron. (From Rép. de Pharm.)

Liq. Ferri Nitratis.—F. T. Bower finds that when the officinal directions are followed, very variable products are obtained. The causes for this he attributes to the uncertain reaction between the iron and the cold dilute nitric acid, and on the influence of slight variations in the temperature. Three samples of the solution prepared according to the U. S. P., but in smaller quantities, yielded respectively 8.46, 11.28, and 16.93 grains of ferric oxide from a fluid ounce. The Pharmacopœia describes the solution of a pale amber color; the process yields a solution darker than pale amber. After trying various methods, the author found the following to yield a satisfactory product, a fluid ounce of which will yield 10 grains of dry ferric oxide: Hydrated sesquioxide of iron is prepared from 7 fluid ounces of solution of tersulphate of iron by the well-known method; this is then added, with constant stirring, to a cold solution of 2 troy ounces and 250 grains of nitric acid in an equal volume of water, as long as it dissolves. The solution is filtered, the filter washed with repeated portions of water, 375 grains of nitric acid are added, and after it has attained a pale amber color, it is brought to the measure of 36 fluid ounces. A. J. Ph., Aug. 1876, p. 356.

Liq. Ferri Acetici, Ph. Germ.—Dr. G. Mankiewicz has found that when the precipitated hydrated sesquioxide of iron, after washing, is allowed to freeze on the strainer, and at a temperature of at least —5° C. (= 23° F.), the water will flow off, upon thawing, so completely that there is no necessity to resort to expression in order to reduce the weight of the precipitate to five parts, as required by the Germ. Ph. The precipitate, moreover, dissolves very readily and completely in dilute acetic acid. Arch. Ph., June, 1877, p. 510.

Solution of Bromide of Arsenic.—The peculiar solution which goes by this name is that introduced many years ago by Dr. Clemens, of Frankfort on the Main, and which Dorvault, in his "Officine," calls "Liqueur Clémens," or "Liqueur à l'arsenite de bromure de potassium." It is intended as a substitute for Fowler's solution. In "New Rem." (April, 1877, p. 126) the following formula for its preparation is given: Arsenious acid, 1 part; carbonate of potassium, 1 part; bromine, 2 parts; distilled water, to

make 93 parts. Boil the carbonate of potassium and the acid with most of the water until solution is effected; when cold, add the bromine and enough water to make 93 parts by weight. Age is supposed to improve this mixture, as the bromine gradually enters into combination. The dose of the solution is 1 to 4 drops in water, once or twice daily.

Acetic Cantharidal Vesicant.—"Country Chemist" suggests the following formula, which is a modification of a formula proposed by James Dean as a substitute or improvement on the "*Liq. Epispasticus*," B. P. (see "Proceedings," 1876, p. 80): Moisten ℥viij of freshly powdered cantharides with f℥v of acetic ether, and pack it lightly in a cylindrical percolator; then cover with a paper disk, and pour on 4 fluid ounces of the menstruum. When the liquid begins to drop from the percolator, close the lower orifice with a cork, and having closely covered the percolator, set it aside for twenty-four hours. Then percolate 16 fluid ounces, filter if necessary, and bottle in 1-ounce bottles. The part to be blistered is painted with this vesicant, using a small brush or a piece of linen. Several coatings may be necessary, unless the epidermis is very tender, as is the case with children or delicate females. The action is hastened by covering the part with oiled silk or rubber cloth, and effects a blister in from fifteen minutes to one hour. The Pharm., March, 1877, p. 65.

Mixtures of Quinia and Ammonia.—William McIntyre draws attention to the formulas, hitherto published, for the preparation of solutions of quinia with ammonia. These are the following:

Liquor Quiniæ Ammoniatus, Bastick.—Sulphate of quinia, 32 grains; alcohol, 49 per cent., f℥iiiss.; ammonia water, f℥ss.

Tinctura Quiniæ Ammoniata, Ince.—Sulphate of quinia, 32 grains; alcohol, 49 per cent., f℥iiiss.; spirit of ammonia, f℥ss.

Liquor Quiniæ Ammoniatus, Squire.—Sulphate of quinia, 32 grains; stronger water of ammonia, f℥j; alcohol, 49 per cent., sufficient to make f℥iv.

Tinctura Quiniæ Ammoniata, Curtis.—Quinia (alkaloid), 32 grains; aromatic spirit of ammonia, f℥iv.

Prof. J. M. Maisch appends to this the following formula, which is taken from Squire's "Pharmacopœia of the London Hospitals:"

Liquor Quiniæ Ammmoniatus.—Sulphate of quinia, 24 grains; strong solution of ammonia, ℥iv; rectified spirit (sp. gr. 0.838) to ℥iij. A. J. Ph., Nov. 1876, p. 488.

MELLITA.

Mel Depuratum.—E. Dannenberg recommends the following simple method which, he states, will readily yield permanently clarified honey: The honey is mixed with *one-half its weight of water* and boiled from one-fourth to one-half an hour, skimming it in the meantime and adding five or six times during the boiling *as much cold water* as is necessary to interrupt the ebullition for from one-fourth to one-half a minute, not more. After boiling for half, and not exceeding three-fourths of an hour, the honey is strained *hot* on a conical filter, etc. The author observes that the method applies only to country honey, since he has never used Cuba honey. Arch. Ph., Sept. 1876, p. 256.

Clarified Honey.—A. F. W. Neynaber finds that if honey is diluted so as to be somewhat lighter than simple syrup, and it is then exposed in a covered vessel to a temperature of 112° F. for eight to twelve hours, skimmed, and drained through flannel while at that temperature, a perfectly clear preparation will be obtained, and the strained honey will be of the proper consistence, owing to sufficient evaporation during the process of straining. Drug. Circ., March, 1877, p. 53.

MISTURÆ.

Mistura Glycyrrhizæ Comp.—A. P. Brown offers a modification of the officinal process, which yields a clear and acceptable preparation. An ammoniacal infusion of liquorice root is prepared from ℥iv of the ground root, as directed in his process for preparing a syrup of liquorice root (which see under "Syrupi"); this is evaporated to f℥xij, and mixed with the sugar, gum arabic, and other ingredients directed in the officinal formula. Finally, ammonia water is added carefully to render the solution clear. The product is brownish-yellow, and almost entirely free from sediment. A. J. Ph., Nov. 1876, p. 488.

Emulsions of Certain Resins.—T. Greenish had overcome the difficulty of obtaining a smooth mixture of copaiva resin, by first triturating the copaiva resin with a portion of sugar of milk, then with a little alcohol, until uniform. The smooth mixture then readily emulsionized when triturated with gum arabic, followed by the gradual addition of water, the following quantities being used:

℞.—Resinæ copaibæ, ʒiss.; sacch. lactis, ʒiij; spirit. vini rect.,

℥iij; pulv. acaciæ, ℥v; aquæ ad ℨvj. Misce. By the application of this method to

Mistura Guaiaci, *B. P.*, the author obtained a very much improved mixture. The modified formula is as follows:

℞. Guaiacum resin, in powder, ½ ounce; sugar of milk, ½ ounce; gum arabic, in powder, ½ ounce; rectified spirit, 5 fluid drachms; cinnamon water, sufficient to make one pint. Ph., J. Trans., Nov. 1876, p. 369.

Emulsions of Substances Insoluble in Water.—A commission, appointed for the purposes of recommending "Standard Formulas" for certain new preparations, to the Pharm. Society of Paris, recommend a tincture of soap-bark (which see) for the purpose of emulsionizing substances insoluble in water.

Emulsion of Balsam of Tolu is recommended to be prepared by dissolving 2 parts of balsam of tolu in 10 parts of 90 per cent. alcohol, adding to this solution 10 parts of tincture of soap-bark, and finally, 78 parts of water.

Emulsions of Copaiva, of Tar, and of Oil of Cade are recommended to be prepared in the same way. New Rem., May, 1877, p. 156, from Rép. de Pharm., 1877, p. 193.

Mixture of Copaiba Resin.—Alfred Balkwill proposes the following form of exhibiting copaiba resin, which makes an elegant and satisfactory preparation.

Dissolve ℥iss. of copaiba resin in ℥iv of oil of sweet almonds, with gentle heat, add ℥ss. solution of potassa, and form an emulsion with ℨiss. of mucilage of gum arabic, and sufficient water to make ℨvj. Flavor with gtt. vj oil of cinnamon. A. J. Ph., 1877, p. 190.

Cod-liver Oil Jelly.—The following formula, published by Mr. Pratt, of York, England, originated with Mr. Agnew, of Liverpool, and is highly recommended:

Cod-liver oil, 72 parts; sugar, 16.88 parts; citric acid, 0.6 parts; gelatin, 2.76 parts; water, 7.56 parts; essential oil, (?) 0.2 parts. New Rem., Feb. 1877, p. 63.

Emulsion of Chloroform.—Jaillard states that the best emulsion of chloroform is obtained by agitating chloroform with 100 times the quantity, or more, of milk, which may be sweetened; it thereby becomes very finely divided, and remains permanently suspended. A. J. Ph., June, 1877, p. 315, from L'Univer. Pharm.

Chloral Cream.—The following formula appears in Ph. J. Trans., July 15th, 1876, taken from Rép. de Ph., June 25th, 1876:

Dissolve 5 grams of chloral hydrate in 15 grams of water, and mix in 100 grams of sugar by trituration; flavor with artificial essence of pineapple or with essence of peppermint. The preparation is semifluid and beautifully white. It may be dissolved in water to form a syrup.

Mistura Antispasmodica Concent., Potion Antispasmodique Opiacée—The following formula is given in New Rem. (April, 1877, p. 125): R. Spiritus menthæ pip., 1 gram; alcoholis, 6 grams; vini opii, 10 grams; ætheris, 30 grams. M. Ten drops of this mixture, added to a tablespoonful of water, represent 15 grains, or one tablespoonful, of the ordinary antispasmodic mixture. The concentrated solution is proposed for the purpose of facilitating a supply to be carried in the pocket.

Basham's Mixture.—Thos. S. Wiegand furnishes the following formula: Tinct. ferri chloridi, 3 parts; acid. acetic. dil., 4 parts; liquor ammon. acet., 32 parts; curaçoa, 8 parts; syrup. cortic. aurant., 12 parts; aquæ, q. s.; ft., 64 parts. A. J. Ph., May, 1877, p. 232.

Lac Ferri.—Under this name a preparation is sold containing ferric phosphate in suspension. It is made by precipitating very dilute solutions of ferric chloride and phosphate of sodium, washing carefully and removing the last traces of free acid by carbonate of sodium. The amount of phosphate is then ascertained by drying a portion, and the moist precipitate is mixed with water until the mixture contains 1.0 to 1.2 per cent. of ferric phosphate. A. J. Ph., April, 1877, p. 176; Pharm. Zeit., No. 7, 1877.

PILULÆ.

Pills and Pill Masses.—Hans M. Wilder, referring to certain objections made by Mr. Moore to plain pills, the chief of which seems to be that when to be made freshly too much time is consumed, suggests that those pills which are often called for be kept in mass, ready for rolling out. He has tried this and found it very practical and convenient. The pill mass is made to the proper consistence, and, after ascertaining the weight required for each pill, placed in properly marked jars. He advises that only a week's supply of the mass should be made. A. J. Ph., April, 1877, p. 162.

Pill Coating.—H. Hildebrand finds that powdered elm bark is a very suitable substance for coating pills extemporaneously. While not as elegant as some substances, it affords an efficient coating, which may be readily applied, and the pills possess a further advantage in being swallowed easily owing to the slippery nature of the coating when brought in contact with the moist tongue. The pills, made of a hard mass and well rounded on a smooth surface in the usual way, are moistened with simple syrup, diluted with one-fourth the quantity of water, and then rolled about with the outspread fingers in a comparatively large quantity of finely powdered elm bark. If the pills are to be delivered to the customer immediately, they must be dispensed with a little powdered bark in the box; if a quarter of an hour's time is granted, the pills will become sufficiently dry, if exposed in a warm place, to be dispensed without the powder. A second coating may be given if desired. The Pharm., November, 1876, p. 323.

Sugar-coated Pills.—J. B. Moore contributes a very lengthy paper in defence of sugar-coated pills, to which, as well as to some editorial remarks by Prof. Maisch, the reader is referred. A. J. Ph., March, 1877, pp. 104 to 126; ibid, p. 139.

Pill Excipients, Glycerinum Tragacanthæ.—A mucilage of tragacanth and glycerin has at various times been recommended as a suitable excipient for pills, with the special view of keeping the mass in a plastic and readily diffusible condition.

J. C. Thresh has experimented with a view to testing its value in this direction. The glycerites used for these experiments were:

1. Pulv. tragacanth, ʒiij; glycerin, ʒix; water, ʒiv.
2. Pulv. tragacanth, ʒiij; glycerin, water, āā ʒvj.

The glycerite as prepared by either formula, an opaque and not very tenacious mass is obtained, which becomes transparent and very tenacious after standing a few days, a result which will take place in a few minutes by the heat of a water-bath. As a result of his experiments, the author arrives at the following conclusions:

1st. That the glycerin and tragacanth excipient is totally useless for keeping the pil. aloes et myrrhæ and pil. aloes et ferri in a plastic condition, but that it makes with the latter a better pill mass than conserve of roses for immediate use.

2d. That for pil. ipecac. co. it is not so good an excipient as treacle. That its advantage in pil. hyd. subchlor. is doubtful. When this pill is first made it is more cleanly and rolls better if

made with tragacanth than when made with castor oil; and pills of the former kind, when placed in boxes with magnesia, do not acquire the unsightly appearance which the ordinary pills do.

In pil. sapo. co. the advantages are also doubtful.

3d. In pil. aloes Barb., and others of a similar character, the conserve is to be preferred.

4th. In pil. coloc. co., pil. gambog. co., the glycerin medium answers admirably, and might with advantage be ordered by the Pharmacopœia (B. P.) for that purpose. In pil. rhei co. and pil. scillæ co., it also appears to possess advantages over the officinal excipients, but the author does not feel prepared to recommend its being substituted for them.

The author considers that while the glycerin and tragacanth excipient does not answer the expectation, and scarcely bears out the assertion of some who have recommended it, it is nevertheless a very convenient substance to have upon the dispensing counter. It is scarcely necessary to state that the pills experimented with are those of the B. Ph. Ph. J. Trans., March 24th, 1877, p. 769.

Phosphorus Pills.—E. J. Appleby has experimented with butter of cacao, balsam of tolu, and common yellow resin as vehicles for phosphorus in pills, and gives preference to the phosphorized resin for the following reasons: It is easily prepared and may be preserved under water for any length of time; it can be quickly reduced to a fine powder and made into a mass with compound tragacanth or other ingredients; it can be conveniently made so that twenty-five parts of the resin shall contain one part of phosphorus in solution. Pills prepared with the resin are thoroughly disintegrated by cold water in a short time. As a very small portion of the resin only is required for an ordinary dose of phosphorus, other ingredients may be combined with it without making too large a pill. Ph. J. Trans., October 7th, 1876, p. 289.

Podophyllin Pills ("*Castor Oil Pills*").—The following formula is given in "New Rem." (April, 1877, p. 125): Resin podophylli, gr. iij; ext. hyoscyami, gr. iij; saponis, gr. ivss.; syrupi, gtt. vj. M. Make twelve pills.

Emmenagogue Pills.—The following formula is given in "Union Médicale:" R. Aloes, gr. xv; rue, saffron, savin, āā gr. viiss. M. Divide into ten pills, one of which is to be taken morning and evening, commencing two or three days before the supposed menstrual epoch. New Rem., November, 1876, p. 350.

Mosler's Tapeworm Bolus.—The following formula is given in "New Remedies" (May, 1877, p. 156): Kousso flower, 30 grams; kamala, 15 grams; oleo-resin of male fern, 4 grams; honey, q. s. Mix and divide into sixty bolus, which may be sprinkled over with powdered cinnamon, and of which thirty should be taken in the evening, and ten or twenty more the following morning.

PULVERES.

Mercury and Chalk (Grey Powder).—Alexander Bottle prepares it in a bottle by agitation, using one with a wide mouth, and finds that the metal can be minutely subdivided with an expenditure of little, if any, more time and labor than is required to be devoted to the preparation of a tincture. Ph. J. Trans., Dec. 9th, 1876, p. 469.

Effervescing Carbonate of Iron.—Dr. T. Skinner's formula. Tartaric acid, 24 parts; bicarbonate of sodium, 40 parts; protosulphate of iron, 10 parts; powdered sugar, 14 parts; citric acid, 2 parts. Mix the finely powdered dry materials as follows: First, the sulphate of iron with the sugar and part of the tartaric acid; secondly, the citric acid with the remainder of the tartaric acid and the soda. Stir the two mixtures together, and unite by sifting. Finally granulate in an open metal vessel over a water-bath. New Rem., April, 1877, p. 125, from the Pharmacist.

Dentifrice.—L. C. Hogan gives the following formula for "a fine dentifrice:" Mix thoroughly 24 parts of precipitated chalk, 8 parts of powdered pumice, 4 parts of powdered milk sugar, and 1½ parts of essence of white rose. The Pharm., Oct. 1876, p. 290.

RESINÆ.

Eclectic Resinoids, Examination.—L. F. Beach has examined the resinoids *podophyllin*, *cimicifugin*, and *hydrastin*.

Podophyllin.—Three examples from different manufacturers were examined with the following results:

	No. 1.	No. 2.	No. 3.
Berberina, ...	Trace.	None.	Trace.
Residue (of resin) after treating 1 gram with 2 fl. oz. acidified water, ...	0.830	0.698	0.840
Portion soluble by treating 1 gram with 10 c.c. of water, ...	0.060	0.163	0.099

No inorganic constituents, no starches, no sugar could be found in any of the samples.

Cimicifugin.—Two samples were examined. They contained no metallic salts, no starches, no appreciable proportion of sugar, and were very nearly all soluble in alcohol. By treating 1 gram with 10 c.c. of water, and washing with 5 c.c. more, 0.035 gram was dissolved from No. 1, and 0.092 gram from No. 2. The author succeeded in obtaining the crystallizable principle mentioned by T. E. Conard ("Proceedings," 1871, p. 264) from No. 1, by following that author's directions for its separation from the root. It crystallizes in the hexagonal system.

Hydrastin.—Six samples were examined. One gram of each was exhausted with boiling water; the residue of each was dried and weighed; the watery solution was concentrated, treated with hydrochloric acid, and the crystals obtained were dried and weighed as hydrochlorate of berberina; the mother liquor was precipitated with ammonia, and the dried precipitate was estimated as hydrastia. The author searched for the third alkaloid of hydrastis root, described by A. K. Hale ("Am. J. Ph.," 1873, p. 247, and 1875, p. 481), but failed to find it. The following are the author's results, expressed in percentages:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.
Berberina hydrochlorate, .	35.1	21.9	6 9	28.0	36.0	100.0
Hydrastia, ...	1.7	17.4	6.7	5.1	6.8	0.0
Insoluble in hot water, . .	25.0	21.2	23.5	23.5	25.2	0.0

A. J. Ph., Sept. 1876, p. 385.

J. R. Little examined the so-called resinoids *sanguinarin*, *leptandrin*, and *aconitin*.

Sanguinarin.—By Schiel's method ("Husemann's Pflanzenstoffe," p. 200), the author obtained from a sample (No. 1) 6.2 per cent. of the alkaloid sanguinarina; from another sample (No. 3) he obtained 6.0 per cent. by a simplified method, which consists in exhausting the sample with ether, precipitating the solution by phospho-molybdic acid, digesting the precipitate with a solution of potassa, exhausting the mixture with chloroform, evaporating the chloroform, and weighing the residue as alkaloid. Sample No. 3 also contained magnesia, and was lighter colored than Nos. 1 and 2. The following shows the action of solvents on 0.500 gram of the resinoid:

	No. 1.	No. 2.	No. 3.
Residue insoluble in 25 c.c. water, ...	0.327	0.346	0.357
Residue insoluble in 10 c.c. alcohol, . . .	0.140	0.205	0.294
Residue insoluble in 10 c.c., one-tenth normal solution of potassa, ...	0.331	0.312	0.389
Residue insoluble in 10 c.c. ether, ...	0.163	0.345	0.330

Leptandrin.—Four samples were examined, of which Nos. 1 and 4 gave marked evidence of an alkaloid, while No. 2 gave slight evidence. The samples were tested with acidulated water, the filtered solution treated with ammonia and exhausted with chloroform, and the chloroform evaporated. The residue gave the following reaction when dissolved in acidulated water: iodo-hydrargyrate of potassium, phospho-molybdic acid, metatungstic acid, and some other general precipitants for alkaloids, gave precipitates. Frœhde's reagent produced a brown color; nitric acid produced a slight yellow color, not affected by protochloride of tin; sulphuric acid did not affect it. The action of solvents upon the resinoids was as follows, 0.500 gram of the material being taken:

	No. 1.	No. 2.	No. 3.	No. 4.
Residue insoluble in 25 c.c. water, . .	0.310	0.183	0.190	0 224
Residue insoluble in 10 c.c. alcohol, .	0.153	0.265	0.094	0.193
Residue insoluble in 10 c.c., one-tenth normal solution of potassa, . . .	0.202	0 338	0 078	0.140
Residue insoluble in 10 c.c. ether, . .	0.187	0.316	0.217	0.116

No. 1 contained traces of lead salt; No. 2 contained 18 per cent. of magnesia.

Aconitin.—Two samples of the resinoid aconitin were examined, and gave, by Mayer's volumetric method, respectively 3.34 and 4.16 per cent. of the alkaloid *aconitia*, while by a gravimetric method, 4.17 and 4.34 per cent. respectively were obtained. This gravimetric method consisted in simply drying and weighing the precipitates formed by an excess of Mayer's reagent, 0.170 gram corresponding—as determined in three experiments with what was believed to be pure aconitia—to 0.100 gram of the pure alkaloid. The imperfect subsidence of the precipitate in the volumetric method makes this last-named method more desirable. Both samples of resinoid contained an abundance of magnesia (No. 1, 11 per cent.). Ibid., p. 387.

SPIRITUS.

Compound Spirit of Ether.—R. Rother criticizes this officinal of the Pharmacopœia. He considers the *ethereal oil* to be inert, and hence regards its introduction as wasteful, and believes a spirit conforming to that of the German Pharmacopœia to be a more desirable preparation. He also points out some inconsistencies in the directions for the preparation and the description of the

product in the process for ethereal oil. The Pharm., February, 1877, p. 41.

Spirit of Nitrous Ether.—The generally unsatisfactory character of the commercial spirit of nitrous ether is so well established that the only safeguard to the pharmacist is to prepare this preparation if he desires a preparation corresponding to the requirements of the Pharmacopœia. J. U. Lloyd has recently examined a number of commercial samples, and found their sp. gravities to vary between .890 and .940. He attributes these high sp. gravities, very correctly, to the use of alcohol of insufficient strength for diluting the nitrous ether. Such a spirit may originally contain the requisite percentage of nitrous ether, that being the least item of expense; but, unless it is in admixture with alcohol of sufficient strength, it rapidly changes and becomes worthless. While a few manufacturers seem to furnish a product of the proper alcoholic strength, the author maintains that for one pound of such spirit there are a hundred pounds of improperly prepared sold. A. J. Ph., July, 1876, p. 294.

Spirit of Chloroform.—R. Rother is of the opinion that the proportion of chloroform to alcohol is badly contrived, and that the alcohol is stronger than necessary. He therefore recommends a modification as follows: 1 volume of chloroform, 2 volumes of water, and 5 volumes of strong alcohol, making the preparation 1 volume to 8, whereas now it is $\frac{2}{3}$ volume to $6\frac{2}{3}$. The Pharm., Feb. 1877, p. 42.

Spirit of Camphor.—R. Rother finds that the camphor increases the volume of the alcohol by 1 fluid ounce for each troy ounce dissolved. He suggests that the preparation be brought to such strength that 1 troy ounce of camphor shall be represented in 8 fluid ounces of the spirit, and that the alcoholic strength can be conveniently reduced as follows: Place 16 troy ounces of broken camphor on a filter, add strong alcohol until the filtrate measures 7 pints, and add, during agitation, water to make the measure of 8 pints. The Pharm., Feb. 1877, p. 43.

Bay Rum.—L. C. Hogan recommends the following satisfactory and cheap formula: 4 fluid drachms oil of bay; 8 fluid ounces Jamaica rum; $4\frac{1}{2}$ pints water; 3 pints stronger alcohol. Filter through magnesia and charcoal, if necessary. The Pharm., October, 1876, p. 290.

SUPPOSITORIÆ.

Suppositories.—L. C. Hogan communicates some practical hints on suppository making. Speaking of the application of extracts in this connection, he states that he finds it convenient to keep such as are used for suppositories in a very fine powder, in which form they are readily incorporated with the fat. The powdered extracts are obtained by carefully drying, then powdering and adding sufficient dextrin to make the original weight. The Pharm., March, 1877, p. 66.

SYRUPS.

Syrup of Ipecacuanha.—William H. Righter, Jr., finds that when fluid extract of ipecacuanha is diluted with water, filtered, and then evaporated to its original volume, it will mix with syrup without producing precipitation. By adding 1 fluid ounce of this purified fluid extract to 3 fluid ounces of syrup of tolu, and 12 fluid ounces of simple syrup, a pleasantly flavored syrup of ipecac is obtained, which is not prone to fermentation. A. J. Ph., Jan. 1877, p. 5.

Syrup of Ipecacuanha.—A. F. W. Neynaber suggests the following formula for preparing a clear syrup: Digest 1 troy ounce of ipecacuanha (in Nos. 30 or 40 powder) for forty-eight hours on a water-bath with 1 fluid ounce of alcohol and 3 fluid ounces of water; allow to cool, transfer the mixture to a filter, and allow the liquid to pass. Pour on the filter a mixture of $\frac{1}{2}$ fluid ounce of alcohol and $1\frac{1}{2}$ fluid ounce of water, then follow with water to make the liquid 8 fluid ounces. Add to this $12\frac{1}{2}$ troy ounces of best loaf sugar, boil, and strain to 16 fluid ounces. Drug. Circ., October, 1876, p. 170.

Syrup of lactucarium is recommended by the same author to be prepared in a similar manner, substituting lactucarium in No. 20 powder for the ipecacuanha, washing the residue on the filter with a mixture of 1 fluid part of alcohol and 3 of water, until 10 fluid ounces of liquid are obtained, and making a pint of syrup with 12 troy ounces of sugar. The syrup is clear and stable. Ibid., 171.

Compound Syrup of Sarsaparilla.—The same author communicated the following modification of the officinal formula for compound syrup of sarsaparilla, whereby the drugs employed in its preparation are more accurately represented than when the officinal

process is employed: Percolate slowly 3 troy ounces of coarsely powdered (No. 20) guaiacum wood with a mixture of 8 fluid ounces of 95 per cent. alcohol and 3½ pints of water; continue the percolation with water to 6½ pints of percolate in all, to which add 1½ pint of 95 per cent. alcohol. With this mixture percolate 24 troy ounces of sarsaparilla root (in coarse powder, No. 16), 2 troy ounces of pale rose (No. 8 powder), 2 troy ounces of senna (No. 8 powder), and 2 troy ounces of cut liquorice root; macerating the ingredients for three or four days before allowing the percolation to proceed. Set aside the first 4 pints, continue the percolation, with the aid of water, until 6 pints more have passed, evaporate this to 12 fluid ounces, mix with the reserved portion, and dissolve in the mixture 96 troy ounces of white sugar by heating to the boiling-point. Strain, and add when cold, 5 minims oil of sassafras, 5 minims oil of anise, and 3 minims oil of wintergreen, dissolved in 1 fluid ounce of alcohol. Ibid., November, 1876, p. 182.

Syrup of Orange-peel.—This preparation being generally used as a vehicle for disagreeable medicines, is, by C. S. N. Hallberg, recommended to be prepared from a spirit of orange, made by dissolving one part of oil in fifteen parts of strong alcohol, the process of the U. S. Ph. for syrup of tolu being followed in the preparation of this syrup, and the spirit used in the same proportion as the tincture of tolu in that process.

Arom. Syrup of rhubarb may be improved by the following modification of the officinal process: After exhausting the rhubarb, etc., with the alcoholic menstruum, rub it up with a small quantity of carbonate of magnesium and some sand, pack the mixture loosely into a funnel, percolate it with water until sufficient percolate is obtained to make the requisite quantity of syrup, and, while this is still hot, add the aromatic tincture of rhubarb. The resulting preparation is transparent and will not precipitate.

Syrup of ipecacuanha forms a much nicer preparation than the officinal product if the fluid extract is mixed with sufficient water, allowed to stand, filtered, and then converted into syrup by the addition of a proper quantity of sugar.

Syrup of squill is improved by boiling the vinegar of squill, and skimming off the coagulum previous to dissolving the sugar. A. J. Ph., August, 1876, pp. 341–342.

Syrup of Rhubarb.—L. C. Hogan recommends the following modification of the officinal formula for preparing this syrup, which

is founded on the observation of R. Rother that the resinous matter of rhubarb is completely soluble in ammonia: Mix three fluid ounces of fluid extract of rhubarb with sufficient water to make a pint; allow to stand until resinous matter has all precipitated; then add sufficient ammonia water to dissolve the precipitate; add twenty-four troy ounces of sugar, and dissolve with gentle heat.

Aromatic syrup of rhubarb may be obtained of fine aroma, rich color, and beautifully bright and clear, by adding to the menstruum (For extracting the rhubarb and spices? Rep.), when following the process of the Pharmacopœia, two fluid drachms of ammonia water. The Pharm., October, 1876, p. 289.

Syrups of Rhubarb.—A. F. W. Neynaber suggests the following improved formulas for making syrup of rhubarb, syrup of rhubarb and carbonate of potassium, and aromatic syrup of rhubarb:

Syrup of Rhubarb.—Moisten, pack, and percolate slowly three troy ounces of rhubarb (in powder No. 20) with a menstruum of six fluid ounces of alcohol and nine fluid ounces of water; follow this with water to make one pint of percolate, to which add twenty-two ounces of sugar, boil, and strain; the finished syrup should measure 32 fluid ounces by the addition of water. (? Rep.)

Syrup of Rhubarb and Carbonate of Potassium (Modification of the Formula of the Ph. Germ.).—The rhubarb should be cut into fine pieces, so as to pass through a sieve of 4 meshes, and deprived of the fine powder by a sieve of 20 meshes. Take of such cut rhubarb, 3 troy ounces; carbonate of potassium, $\frac{1}{4}$ troy ounce; boiling water, 1 pint. Macerate in a stone jar during one night; transfer to a percolator, allow the liquid to run off; follow with water, until 14 troy ounces in all have been obtained; dissolve in this, by boiling, 22 troy ounces of sugar; strain, and when cold add 8 drops oil of peppermint, dissolved in $\frac{1}{2}$ fluid ounce of alcohol.

Aromatic Syrup of Rhubarb.—Moisten, pack, and percolate slowly $2\frac{1}{2}$ troy ounces of rhubarb (in powder No. 20) with a menstruum of 4 fluid ounces of alcohol and 6 fluid ounces of water. When the menstruum has all been used, pack on top of the rhubarb, cloves, cinnamon, āā $\frac{1}{2}$ troy ounce; nutmeg, $\frac{1}{4}$ troy ounce (all in powder No. 20), previously moistened, and then percolate with a menstruum of 4 fluid ounces of alcohol and 8 fluid ounces of water. Follow this with water until 3 pints and 10 fluid ounces of total percolate have been obtained, in which dissolve $5\frac{1}{4}$ pounds

avoirdupois of the best loaf sugar at a boiling heat. Drug. Circ., Dec. 1876, p. 199.

Syrup of wild cherry bark, possessing a deep brown-red color and strong odor of hydrocyanic acid, is obtained, according to John Ritter, by first moistening the five troy ounces of powdered wild cherry bark with a mixture of two fluid ounces of glycerin and one-half a fluid ounce of distilled water, allowing it to stand in a closed vessel for twenty-four hours, and then proceeding according to the directions of the Pharmacopœia. A. J. Ph., Jan. 1877, p. 5.

Syrup Tolu.—C. S. N. Hallberg considers that in the officinal process the medicinal virtues of the tolu are sacrificed to elegance. He recommends that the tincture should be triturated with the carbonate of magnesium and a small quantity of sugar; that a sufficient quantity of hot syrup should then be added, and after standing a short time, strained through flannel.

Syrup of ginger may also be advantageously made by this process. A. J. Ph., Aug. 1876, p. 341.

Syrup of Liquorice Root.—A. P. Brown proposes the following formula for a syrup of liquorice root, which is very useful for masking the bitterness of quinia, etc.: Place ℥iv of ground liquorice root in a wide-mouthed bottle; pour upon it a pint of water mixed with f ℥j of ammonia water; macerate for forty-eight hours; transfer to a funnel; allow the liquid to drain; percolate with sufficient water to make 2 pints of percolate; allow this to stand until any particles have subsided; evaporate to f ℥viij, filter, and dissolve in the filtrate ℥xiij of granulated sugar by the aid of heat. A. J. Ph., Nov. 1876, p. 487.

Syrup of Extract of Liquorice.—L. C. Hogan recommends this preparation, prepared as follows: Mix 4 fluid ounces of glycerin and 12 fluid ounces of water; dissolve 2 troy ounces of extract of liquorice in the mixture, in which, after filtration, dissolve 24 troy ounces of sugar by agitation. The Pharm., October, 1876, p. 289.

Syrup of Coffee.—R. H. Bernhardt suggests the following formula for a syrup of coffee: Percolate 2 troy ounces of roasted coffee, in moderately fine powder, with cold water until 1 pint of percolate is obtained. Pour this upon 28 troy ounces of sugar contained in a glass percolator, the orifice of which is stopped, while the neck is provided with a sponge to serve as a filter for the syrup. When the sugar is dissolved down to half its original

volume, the cork is removed and the liquid allowed to drop. Care should be taken that the syrup passes drop by drop, which insures the complete solution of the sugar. The infusion of coffee should be perfectly clear before pouring it in the sugar. Drug. Circ., Sept. 1876, p. 152.

Syrup of Coca.—Coca leaves, 100 grams; boiling water, 1000 grams; infuse 24 hours, express, filter, and dissolve 175 grams of sugar in each 100 grams of filtrate. A. J. Ph., May, 1877, p. 236.

Syrupus Eucalypti.—The following formula has been adopted by a commission on "Standard Formulas" of the Pharm. Society of Paris. Eucalyptus leaves, 50 grams; eucalyptus water (see Aquæ Medicatæ), 100 grams; water, q. s.; sugar, 650 grams. Infuse the eucalyptus leaves in 250 grams of water, strain and express, after 3 hours filter and make up with water to 250 grams; then add the eucalyptus water, and dissolve the sugar in the liquid, with the aid of a moderate heat, in a covered vessel. New Rem., May, 1877, p. 156, from Rép. de Pharm., 1877, p. 193.

Syrupus Matico et Cort. Granati.—According to Perret this syrup is one of the surest and most effective astringents against dysentery, cholera morbus, acute diarrhœa, etc. It is employed in tablespoonful to wineglassful doses, either pure or diluted with water.

Fol. matico,	20 p.
Cort. granati,	120 "
Aquæ. bullient.,	1200 "
Sacchari,	2000 "

Infuse the matico and pomegranate in the boiling water for 24 hours, filter the infusion, and dissolve the sugar in the filtrate. New Rem., Dec. 1876, p. 372, from L'Union Pharm.

Syrup of Hydrangea Arborescens.—Dr. John King recommends, in the absence of an authoritative formula, that this syrup be prepared from the fluid extract made by his formula (which see under Fluid Extracts), in the proportion of two fluid ounces to fourteen fluid ounces of syrup. New Rem., Nov. 1876, p. 349, from Med. and Surg. Rep.

Syrup of Iodide of Starch.—A formula for this preparation is given in "New Remedies," as follows: Soluble iodide of starch, 10 grams; distilled water, 350 grams; granulated white sugar, 640 grams. Dissolve the iodide of starch in the distilled water and

filter. Dissolve in this the sugar by means of very gentle heat. 20 grams or a tablespoonful of this syrup contains about 0.02 gram ($\frac{1}{3}$ grain) of iodine. The

Soluble iodide of starch may be prepared by dissolving one part of iodine in 90 per cent. alcohol, adding to it nine parts of nitrated starch, and evaporating the mixture on the water-bath at a gentle heat. The residue is triturated with water to a smooth paste, which is heated in a flask on the water-bath until it becomes entirely soluble in water, which is ascertained by removing a sample from time to time and trying its solubility. The

Nitrated starch is starch in which a portion of the hydrogen has been replaced by NO_2. It is prepared by mixing starch with nitric acid, sp. gr. 1500, forming a colorless jelly, which is placed into water, and yields a white curdy insoluble substance, called xyloïdin.

Syrupus Iodo-tannicus.—The following formula is given in "New Remedies" (June, 1877, p. 189): Iodine, 1 gram; alcohol, 90 per cent., 11 grams; syrup of krameria, 988 grams. Dissolve the iodine in the alcohol, and mix the solution with the syrup. It requires about twenty-four hours at ordinary temperature, until the iodine has entered into combination, but on warming to 50° or 60° C. (122° or 140° F.), this may be accomplished at once. This syrup contains 1 part of iodine in 1000 parts. (From Rép. de Pharm.)

Iodized Syrup of Horseradish.—The following formula for this preparation is given in "New Remedies," June, 1877, p. 189: Iodine, 1 gram; alcohol, 90 per cent., 11 grams; compound syrup of horseradish (prepared according to the French Pharmacopœia), 988 grams. Dissolve the iodine in the alcohol and add the solution to the syrup. After twenty-four hours combination has taken place, and the original color of the syrup is restored. (From Rép. de Pharm.)

Syrup of Iodide of Iron.—R. Rother had, in a previous paper, recommended the addition of a portion of sugar to the mixture of iodine, iron, and water, thereby completely preventing the formation of insoluble oxysalt. He again draws attention to this suggestion, and also to the addition of sulphite of sodium to the finished syrup ($\frac{1}{2}$ to 1 gr. to f℥j syrup), whereby it is protected from change. The Pharm., July, 1876, p. 193.

Syrup of Iodide of Iron.—H. F. Meier recommends the introduction of a small quantity of dilute hydriodic acid to this syrup,

and finds that it keeps for a long time after such addition. He adds about 15 minims (representing 2 grains of anhydrous acid) to a pint of the syrup (see Hydriodic Acid in this report). Drug. Circ., Dec. 1876, p. 198.

Syrup of Iodide of Iron.—H. P. Reynolds draws attention to the fact that when discolored syrup of iodide of iron is placed in a water-bath, and the water is brought to the boiling-point, the discoloration disappears, and the syrup assumes its normal color. This process, it appears, has been already recommended by M. E. Fougera as early as 1860. Mr. Reynolds advises that the restored syrup should be transferred to bottles which it will completely fill. A. J. Ph., Feb. 1877, p. 58.

Syrup of Bromide of Iron.—The following formula is given in "New Remedies" (June, 1877, p. 188): Normal solution of bromide of iron (see "Liquores"), 15 grams; syrup, 985 grams. Mix. 20 grams of this syrup, or one tablespoonful, contain 0.10 gram (1.6 grains) bromide of iron.

Syrup of Phosphate of Iron.—E. B. Shuttleworth reviews the various methods that have been proposed from time to time as an improvement of the Br. Ph., and favors the preparation of the syrup from solution of ferrous phosphate, made by the direct solution of metallic iron in dilute phosphoric acid. 36 grains of iron are dissolved in a mixture of 6 fluid drachms of phosphoric acid, sp. gr. 1.5, and 6 fluid drachms of water, contained in a flask, the mouth of which is plugged with cotton. When solution is effected, the liquid is filtered, and added to $8\frac{1}{2}$ fluid ounces of syrup. The author reviews the various forms of phosphoric acid suitable for this preparation, and also observes that the quality of the sugar for the syrup is by no means immaterial. The phosphoric acid should not produce a precipitate with perchloride of iron, and of the various brands of sugar he has found the best loaf of the Decastro & Douner Sugar Refinery Company, New York, to be the most satisfactory. Regarding the proportions of sulphate of iron and phosphate of sodium, when it is desired to retain the method of the Br. Pharm., he states that these are satisfactory, but he recommends the substitution of bicarbonate for acetate of sodium, as recommended by Mr. Howie, using about half as much bicarbonate as acetate is directed. Am. Ph. Jour., Aug. 1876, p. 1.

Compound Syrup of Phosphates, Parrish's Chemical Food.—The formula for this preparation has been frequently found an unprac-

tical one, and is so found by Ernest C. Saunders, who, as the result of his experiments, recommends the following modification:

1. Dissolve 240 grains of iron wire, No. 20, in 3 ounces, by weight, of syrupy phosphoric acid (sp. gr. 1.75), diluted with 4 fluid ounces of water, contained in a flask loosely stopped with tow. When all action has ceased, heat to the boiling-point, and filter through paper in a funnel with a long neck reaching to the bottom of a beaker containing a little syrup, which floating on the iron solution will effectually prevent any oxidation.

2. Dissolve 923 grains of fresh-slaked lime in a mixture of 9½ ounces, by weight, of syrupy phosphoric acid (sp. gr. 1.75) and 14 fluid ounces of water, and filter the solution.

3. Dissolve 54 grains of crystallized carbonate of sodium and 72 grains of carbonate of potassium in a mixture of ½ ounce, by weight, of syrupy phosphoric acid (sp. gr. 1.75) and 1 fluid ounce of water, and filter the solution.

4. Mix the solutions 1, 2, and 3, dilute to the measure of 28 fluid ounces with distilled water, dissolve in it by the aid of heat 3¼ pounds of sugar and 85 grains of powdered cochineal, strain while hot, and, when cold, add 2 fluid ounces of orange-flower water, and sufficient distilled water to make the whole measure 64 fluid ounces. Calcic hydrate is generally sufficiently pure for the above purposes, but it may be made, if convenient, by heating precipitated chalk in a crucible to a full red heat for an hour.

Syrup of Phosphate of Iron, Quinia, and Strychnia, Easton's Syrup.—This preparation is also frequently badly made and deficient in iron. No trouble will be found in making a satisfactory preparation if the following form be strictly followed:

1. Prepare solution of ferrous phosphate in the quantity and manner given above under 1.

2. Prepare the alkaloid quinia from 625 grains of the sulphate by the well-known method, and dissolve it in a solution of 16 grains of strychnia in ½ ounce, by weight, of syrupy phosphoric acid (sp. gr. 1.75) and 1 ounce of water.

3. Mix the solutions 1 and 2, make the measure up to 10 fluid ounces, and mix thoroughly with 54 fluid ounces of simple syrup. Each fluid drachm contains 1 grain each of ferrous phosphate and phosphate of quinia, and $\frac{1}{32}$ grain of phosphate of strychnia.

The author claims no originality in the use of metallic iron in place of precipitated phosphate.

(It must be remembered that the measures and weights in the above formulas are those of the B. Ph.—Rep.) Ph. J. Trans., July 15th, 1876, p. 41.

Compound Syrup of Phosphates.—W. L. Howie draws attention to the inaccuracies in the statement of strength of the compound syrup of phosphates made by Parrish's formula. It is there stated that each teaspoonful of the finished preparation "contains about 2½ grains of phosphate of calcium and 1 grain of phosphate of iron," and this statement has been accepted as correct by various writers. On closer examination of the formula, however, it is found that such a strength is absolutely impossible, and the statement must have been the result of a miscalculation, inaccuracy of figures being, the author observes, not singular in the work in question. If all the iron were utilized in the preparation, the finished product would contain .715 grains of phosphate of iron per fluid drachm. In carrying out the process, however, there is an invariable loss, reducing it to about ½ grain (0.501) per fluid drachm. The exact quantity of phosphate of calcium would be 2 grains per fluid drachm, but always something less. Several commercial samples were examined by the author, among which two samples, obtained direct from the United States, proved to be wofully deficient in both iron and calcium salt, and also contained hydrochloric acid. Year-book of Ph., 1876, p. 588.

TINCTURÆ.

Officinal Tinctures. Determination of Loss in Certain Drugs upon Drying at 110° F., and Quantities dissolved from them by the Officinal Menstrua.—Philip J. Laver has made some experiments by which he determined the amount of moisture in the drugs below enumerated, by keeping them in an air-bath at a temperature of 110° F. until they ceased to lose weight, or, when they contained volatile oils, by exposing them over lime in an air-tight box. He has also determined the amount of soluble matter obtained from 960 grains of the air-dry drugs by exhausting them with the menstrua and according to the U. S. Pharmacopœia. Experiments of this character furnish valuable data for comparison, and deserve to be repeated by others. The following are the author's results:

960 grs. of air-dry	Ginger.	Valerian.	Lobelia.	Calumba.	Sanguinaria.	Cinchona.	Arnica.	Digitalis.	Krameria.
Loss in drying, grs., ...	40	100	74	102	106	100	98	72	60
Yield of soluble matter, grs., .	55	139	146	151	213	154	192	328	440
Yield per fluid ounce, grs., .	6⅞	8 11/16	9⅛	9 7/16	13 5/16	14 7/16	18	20½	27½

The soluble matter was ascertained by drying the residues, as above mentioned, the difference from the original weight, minus the previously ascertained loss by drying, being regarded as the weight of the soluble matter contained in the tincture. A. J. Ph., 1877, p. 6.

Recovering Alcohol from Tincture Residues.—J. U. Lloyd finds that it is often difficult to percolate the residue in displacers with water in order to remove the alcohol, owing to the swelling of the mass. To obviate this difficulty, he invariably removes the mass from the percolator, and repacks it loosely in another; in some instances, as in the case of buchu, squill, aconite, cimicifuga, etc., he finds it necessary to mix the mass with a portion of dry sawdust, so as to increase its permeability, and to render percolation with water possible. A. J. Ph., June, 1877, p. 300.

Tinctures, Practical Production of Several.—R. Rother communicates some modifications of officinal tinctures, or their processes of preparation, by which more satisfactory and staple preparations are obtained.

Tincture of arnica is recommended to be made with a menstruum of equal measures of strong alcohol and water, following the percolation by water to expel the final portion of tincture. A reduction in strength, to conform with tinctures generally—2 ounces to the pint—is also recommended. When made with the officinal menstruum the tincture soon deposits an abundant sediment, which is not the case with this modification. This also represents the crude material better and is of a dark-brown color.

Tincture of Cantharides.—The application of hydrate of potassium, in the proportion of half a drachm to each ounce of the flies employed, secures a tincture which contains all the cantharidin. It is also recommended to increase the strength of the tincture to one ounce in the pint of tincture.

Tincture of Capsicum.—Strong alcohol will extract the capsicum freely and completely, but the author objects to it, as a substitute for diluted alcohol, on the ground of its separating a portion of fixed oil and with it some of the active ingredients. He finds that hydrate of potassium forms a very soluble *salt* (? Rep.) with the capsicum, and he therefore recommends the preparation of the tincture—increased to the strength of one ounce to the pint—by macerating one ounce of powdered capsicum for several hours in half a pint of water containing half a drachm of hydrate of potassium, adding half a pint of strong alcohol, continuing the maceration for several hours more, pressing through muslin, and filtering. The resulting tincture filters rapidly, and is many shades darker than that made by the officinal process.

Tincture of Iodine.—The author finds that the slight traces of chloride of sodium that strong alcohol is capable of dissolving very materially increases its power of dissolving iodine. By the officinal method the solution of iodine is effected very slowly, and he therefore recommends the following modification: Triturate two ounces of iodine and one ounce of chloride of sodium together, transfer to a bottle, pour on one pint of strong alcohol, and shake frequently for fifteen minutes; decant the clear liquid, pour on the residue half a pint of alcohol, shake, and decant as before; repeat this with four fluid ounces of strong alcohol, which will remove the last trace of iodine. The three liquids obtained are united and brought to the measure of two pints with water.

Tincture of Kino.—This the author recommends to be prepared with strong alcohol as menstruum, as recommended by him in a previous paper. (See Proceedings, 1874, p. 91.)

Tincture of opium is recommended to be made by the intervention of heat, from opium assayed to contain ten per cent. of morphia. Ten ounces of such opium is heated, with four and a half pints of water, for half to one hour, or until total disintegration is effected; the heat is then discontinued, and when nearly cool, three and a half pints of strong alcohol are added; after macerating for several hours, with frequent agitation and final repose, the clear liquid is decanted, the residue poured on a strainer, expressed, the resulting tincture measured, and the residue mixed with sufficient water to make, when expressed, the measure of the tincture to one gallon. The tincture is then filtered. The Pharm., August, 1876, pp. 225–228.

Tinct. Cinchonæ Comp., Determination of Alkaloidal Strength.—William D. Robinson has determined the amount of alkaloid obtainable from a number of specimens of comp. tinct. of cinchona, which had been obtained from various sources. The process employed was that of Winkler, and consisted in treating a quantity representing 250 grains of red cinchona bark with equal weights of slaked lime and charcoal, exhausting the sediment repeatedly with cold alcohol, evaporating the mixed alcoholic liquors, and weighing the residue as nearly pure alkaloid. The result showed a great variation in the quality of the barks employed, and was for the 17 samples of bark as follows: 0.287; 0.81; 0.871; 1.03; 1.09; 1.13; 1.20; 1.27; 1.38; 1.62; 1.72; 1.78; 2.05; 2.13; 3.09; 3.11; 4.46. A. J. Ph., Jan. 1877, p. 6.

(In the absence of the details of the author's experiments, the correctness of the above results remains an open question. The menstruum for comp. tinct. of cinchona is so strongly alcoholic that it is difficult to conceive how any portion of the alkaloids can be contained in a sediment as above indicated.—Rep.)

Tinct. Opii Deodorata.—Theodore O. Davis hastens the process of its preparation as follows: Boil the opium with 12 fluid ounces of water for half an hour, and strain with expression; boil the residue with 8 fluid ounces of water for 15 minutes, and strain as before; repeat the operation with 4 fluid ounces of water; evaporate the expressed liquids to 4 fluid ounces; add, when cold, 8 fluid ounces of alcohol (to precipitate gum, starch, pectin, etc.); agitate and filter, and wash filter with alcohol. Distil off the alcohol from filtrate and washings; concentrate to 4 fluid ounces; shake with ether, etc., and finish according to the directions of the Pharmacopœia. The preparation is more perfectly deodorized than by the officinal formula. A. J. Ph., March, 1877, p. 133.

Tincture of Nux Vomica, B. Ph.—L. Siebold's experiments upon a number of commercial samples of tincture of nux vomica lead him to the conclusion that the variation observed in the strength of these tinctures is due mainly to the different degrees of fineness of powder employed by the different operators. He had found tinctures to yield as little as 2.7 grains of extract from 1000 c.c., while others again yielded from 9.0 to 10.1 grains. By adding portions of other tinctures to a given quantity of water, until it became perceptibly and—as near as possible—uniformly bitter, the quantity so added was found to be in proportion to the greater or

less strength of tincture as indicated by the yield of extract. He suggests, therefore, that the tincture should be prepared from finely powdered nux vomica seeds only. Prolonged maceration does not appear to materially improve the quality of the tincture. Yearbook of Ph., 1876, p. 603.

Tincture of Calumbo.—J. B. Moore contends that the menstruum for the officinal tincture of calumbo is too weak, and that the powder directed to be used is too fine. He suggests the following modification as affording a more satisfactory product: Moisten 4 troy ounces of calumbo (in powder No. 20) with sufficient of a mixture of 22 fluid ounces alcohol and $5\frac{1}{2}$ fluid ounces each of glycerin and of water; pack into a close vessel and set aside to macerate for six hours; then pack it into a glass funnel prepared for percolation; percolate with the remainder of the menstruum, and then with sufficient diluted alcohol to obtain 32 fluid ounces of tincture. A bright clear tincture is thus readily obtained, which the author believes will remain permanently so. Drug. Circ., May, 1877, p. 82.

Tincture of Catechu.—Louis Genois states that by manipulating as follows tincture of catechu will not gelatinize: 3 troy ounces of catechu, in small pieces, are digested in 1 pint of water at a temperature of about 100° F., until reduced to a thin, creamlike consistence; the mixture is then allowed to cool; 1 pint of alcohol is added, allowed to stand twelve hours, and filtered; with the filtrate, the cinnamon, previously mixed with an equal bulk of sand, is percolated, the percolation being concluded by the aid of diluted alcohol to two pints. A. J. Ph., March, 1877, p. 98.

Tincture of Kino.—Peter P. Fox recommends the following modification of the officinal formula, and says that so prepared tincture of kino will not gelatinize: Kino, in fine powder, 360 grains; alcohol, glycerin, water, each a sufficient quantity. Mix four measures of alcohol with one of water and one of glycerin; then proceed as directed in the U. S. P., using sufficient of the above menstruum to make half a pint of tincture. A. J. Ph., June, 1877, p. 299.

Tincture of Soap-bark.—The following formula of tinct. of soap-bark, intended for the purpose of making certain emulsions (which see), has been reported by a commission on standard formulas to the Pharm. Society of Paris. Soap-bark (*Quillaya saponaria*), 100 grams; alcohol, 90 per cent., 500 grams. Digest the bark

with the alcohol for half an hour at a temperature near the boiling-point; then allow it to macerate for forty-eight hours longer, frequently shaking, and filter. New Rem., May, 1877, p. 156, from Rép. de Pharm., 1877, p. 193.

Extract of Vanilla..—Charles Becker recommends that 8 ounces of vanilla should be cut very finely, reduced to a coarse powder in a Wedgwood mortar with the aid of 72 ounces of loaf sugar, gradually added, and the mixture very slowly displaced with dilute alcohol until 1 gallon of percolate is obtained. When the process is properly conducted, the last portion of percolate is devoid of color or vanilla flavor. A. J. Pharm., Aug. 1876, p. 342.

Tinctura Phytolaccæ Baccæ Concentrata.—Oliver P. Hooper gives the following formula: Macerate ℥xvj of dried poke berries in Oij of alcohol for 14 days at a temperature of 90° F., express, and filter. Dose for an adult, half a teaspoonful. The tincture has a brown color. The author also gives a formula for

Tinctura Phytolaccæ Radicis Composita.—Macerate ground poke-root, ℥vj, and powdered cardamom, ℥ij, in Oij of diluted alcohol for 14 days, and filter. A. J. Pharm., Nov. 1877, p. 490.

Colorless Tincture of Iodine.—W. H. Darling has found that when colorless tincture of iodine is made by Curtmann's formula—10 drachms of iodine, 13 fluid ounces of rectified spirit, 3 fluid ounces of strong solution of ammonia—iodoform is present as one of the constituents. The author's theory of its production is, that the iodine, acting upon the excess of ammonia, produces hypoiodite of ammonium, and this in its turn reacts with alcohol to produce iodoform, in the same manner as hypochlorite of calcium reacts with alcohol, forming chloroform. The efficacy of the preparation is therefore attributable for the most part to the iodoform it contains. Ph. J. Trans, July 15th, 1876, p. 42.

TROCHISCI.

Chloride of Ammonium Lozenges.—Hager recommends the following formula for these lozenges: Chloride of ammonium, 10.0; powdered extract of liquorice, 80.0; powdered sugar, 30.0; powdered tragacanth, 2.0; glycerin, 5.0; water, sufficient. To be made into tablets about 1–1.5 millim. thick, oblong in shape, and about 10–12 millim. long. The surfaces may be coated with pure silver foil before cutting the lozenges. Ph. Centr. H., Nov. 9th, 1876, p. 388.

Digestive Pastilles of Borivent.—The following formula is given in "New Rem." (April, 1877, p. 126): Bismuth subnitrate, 20 p.; phosphate of calcium, 30 p.; bicarbonate of sodium, 10 p.; carbonate of magnesium, 200 p.; carbonate of iron, 50 p.; sugar, 1000 p. Flavor with peppermint, anise, or orange flowers. Make pastilles of 1 gram each. Dose, 3 to 12 daily.

Digerentia Lozenges.—Under this name Dr. Elmer has introduced a new remedy for dyspepsia, for which the following formula is given: Lactophosphate of lime, gr. j; lactophosphate of magnesia, gr. $\frac{1}{8}$; lactophosphate of iron, gr. $\frac{1}{16}$; pepsin, gr. j; diastase, gr. 1; oil of musk (?), gr. j; glucose, q. s. New Remedies, Feb. 1877, p. 63.

VINA MEDICATA.

Wine of Coca.—The following formula is given in "A. J. Ph." (May, 1877, p. 236): Bruised coca leaves, 30 grams; 60 per cent. alcohol, 60 grams; macerate for twenty-four hours; then add 1000 grams of wine (vin de Lunel), macerate for ten days, with frequent agitation, and filter.

MISCELLANEOUS FORMULÆ.

Multiple Antidote.—In the fourth volume published under the auspices of the "Société de Médecine Légale de France," is an important article on an officinal multiple antidote, by Dr. Jeannel. In it he endeavors to answer the question: Is it possible to prepare an agent which shall be officinal, that is, while susceptible of indefinite preservation, capable of neutralizing chemically all poisons in the stomach or in the intestines, or at least of transforming them into compounds relatively inoffensive, and then determining their prompt evacuation? He discusses the applicability of the agents suggested by Dorvault for this purpose, pointing out what appears to him to be the excellence and defects of each, and finally proposes the following:

Solution of ferric sulphate, sp. gr. 1.45, . . .	100 grams.
Water, ...	800 "
Calcined magnesia, ...	80 "
Washed animal charcoal, ...	40 "

Let the solution of ferric sulphate be kept in a bottle by itself, and the magnesia and charcoal mixed with the water in another bottle. When required, pour the ferric solution into the other bottle

and shake violently. The mixture should be given repeatedly in doses of 50 to 100 grams. According to Jeannel's experiments, this antidote, employed in suitable quantities, renders completely insoluble the preparations of arsenic, zinc, and digitalin, but not the oxide of copper. It leaves in solution notable quantities of mercuric oxide, and appreciable quantities of morphia and strychnia, and does not decompose or precipitate either cyanide of mercury or tartar emetic. It completely saturates free iodine, but acts only partially on solution of the alkaline hypochlorites. New Rem., Dec. 1876, p. 358, from Chem. and Drug.

Colored Fires.—Sergius Kern gives the following tabulated statement of the composition of some colored fires for fireworks. The proportions for each color vary, and are numbered from 1 to 15. These numbers at the same time indicate the relative rapidity with which the mixture will burn, No. 1 burning most rapidly, while No. 15 burns slowest.

GREEN FIRE.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chlorate of potassium,	36	29	24	21	18	16	14	13	12	11	10	9.5	9	8.5	8
Nitrate of barium, . .	40	48	53	57	60	62	64	66	67	68	69	69.5	70	70.5	71
Sulphur, ...	24	23	23	22	22	22	22	21	21	21	21	21	21	21	21

VIOLET FIRE.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chlorate of potassium,	52	52	52	52	52	52	51	51	51	51	51	51	51	51	51
Carbonate of calcium,	29	28	26	24	23	21	20	18	16	15	13	11	10	8	6
Powdered malachite, .	4	5	7	9	10	13	14	16	18	19	21	23	24	26	28
Sulphur, ...	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15

RED FIRE.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Chlorate of potassium,	40	32	27	23	20	18	16	15	13	12	11	10	10	9.25	9
Nitrate of strontium,	39	46	51	55	58	60	61.6	63	64	65	66	67	67.25	68	68.35
Sulphur, ...	18	19	20	20	20.5	21	21.2	21	22	22	22	22	22	22	22
Carbon powder, . . .	3	2	2	2	1.5	1	1.2	1	1	1	1	1	0 75	0.75	0.65

A. J. Ph., Dec. 1876, p. 565; Ch. News, Sept. 29th, 1876.

Plant Fertilizer.—L. C. Hogan finds that when a tablespoonful of a solution prepared by dissolving 4 troy ounces of sulphate of ammonium, 2 troy ounces of nitrate of potassium, and 1 troy ounce of white sugar, in 1 quart of water, is added to 1 gallon of water, and sprinkled on the plants once or twice a week, the soil is

enriched and imparts health and vigor to the plants. The Pharm., Oct. 1876, p. 290.

Casein Cement.—An excellent cement, or liquid glue, may be prepared by coagulating milk with acetic acid or vinegar, washing the precipitated casein with pure water, and then dissolving it in a saturated solution of borax. This produces a clear liquid, of a thick consistence, which has extraordinary adhesiveness and great lustre. New Rem., Feb. 1877, p. 62.

Cement for Aquaria.—A mixture of equal parts of shellac and pumice-stone, used warm, will cement glass, wood, and metal. Another serviceable cement is obtained by fusing flowers of sulphur and adding finely powdered pumice-stone. A. J. Ph., Feb. 1877, p. 73; Pol. Notizbl., 1876, 239.

MATERIA MEDICA.

a. Vegetable Drugs.

ALGÆ.

Fucus Vesiculosus.—It appears that this marine alga has recently again been used in medicine. It was first introduced into medicine, according to J. M. Maisch, through an essay of Russel, in 1750, in which he recommended the sea wrack (also called bladder wrack) in the form of charcoal and jelly; the charcoal—afterwards known as *Æthiops mineralis*—being prepared by heating the plant in a crucible, closed with a perforated cover, until smoke ceased to be given off, while the jelly was made by expressing the mucilaginous liquid, and also by macerating the fucus in an equal weight of sea-water for two weeks, or until it was converted into a kind of jelly. It was used with beneficial effects in scrofulous affections, the jelly being used both externally and internally. The apparent virtue of the vegetable ethiops, as well as of sponge charcoal, led to the study of the medicinal virtues of iodine, and the final introduction of that element into medicine. *Fucus vesiculosus*, Lin., grows on rocky shores of the Atlantic Ocean, near high-water mark, and in marshes which are occasionally overflowed by the tide. It attains a length of 1 to 3 feet, and has a flat thallus $\frac{1}{2}$ to

1 inch wide, with the margin entire, and a distinct midrib running the entire length of the thallus; the vesicles are always in pairs, one being placed on each side of the midrib, spherical or oblong globular in shape, and occasionally attaining the size of a hazelnut. The distinguishing characters of several other species, *F. nodosus*, Lin., *F. serratus*, Lin., *F. siliquosus*, Lin., and *F. natans*, Lin., are also described. All of these species appear to have very similar constituents, which are: Mucilage, mannit, odorous oil, bitter principle, and considerable saline matter containing iodine and bromine. The bladder wrack was formerly admitted in several pharmacopœias, but was afterwards dismissed. In France it has been employed in the form of extract, prepared by exhausting the plant with 54 per cent. alcohol, and which is stated to represent fifteen parts of the fucus; also a syrup, prepared by exhausting 150 parts of the plant with 14 per cent. alcohol, evaporating to 230 parts, and dissolving in it 370 parts of sugar. A fluid extract may be prepared by the process for fluid extract of pipsissewa. A. J. Ph., Sept. 1876, p. 395.

Chondrus Crispus, *Analysis.*—A. H. Church, by his analysis of Irish moss, confirms the presence of a comparatively large percentage of sulphur compound. From carefully cleaned and powdered air-dry moss he obtained 6.41 per cent. The author has not determined the nature of these compounds, only a portion of which appears to be in form of sulphates. 100 parts of the moss were found to contain 9.38 albuminoids, 55.54 mucilage, etc., 2.15 cellulose, 14.15 ash, and 18.78 of water. Arch. Ph., Jan. 1877, p. 61.

FUNGI.

Edible Mushrooms, *Cultivation in Japan.*—Considerable attention appears to be devoted in Japan to the cultivation of mushrooms, the best species being known as "matsutake" and "shutake." While the former is excellent in the fresh state, it soon decomposes, cannot readily be dried, and even when successfully dried is nearly tasteless, and consequently worthless to cookery. The shutake species, however, improves by drying, and is consequently more generally cultivated. The latter species grows naturally on the decayed roots or on the stumps of the "shu tree," a variety of evergreen oak; but the natural supply is not equal to the demand, and hence much skill has been brought to bear on their cultivation, notably by cutting off the trunks of the shu and

other trees, principally oaks, and forcing the growth of the mushrooms on them. This is done as follows: About the beginning of autumn, the trunk, about five or six inches in diameter, of any one of these trees, is selected and cut up into lengths of four or five feet, each piece is then split down lengthwise in four, and on the outer bark slight incisions are either made at once with a hatchet, or the cut logs are left till the following spring, and then deep wounds, seven or eight inches long, are incised on them. Assuming the first course to have been pursued, the logs are placed in a wood or grove where they can get the full benefit of air and heat. In about three years they will be tolerably rotten in parts. After the more rotten parts are removed, they are placed against a rack in a slanting position, and about the middle of the ensuing spring the mushrooms will come forth in abundance, and are then gathered. The logs are then put in water each morning, where they remain until afternoon, when they are taken out, laid lengthwise on the ground, and beaten with a mallet. They are then ranged on end in the same position as before, when, in two or three days, mushrooms will again make their appearance. In Yueshin the custom is to beat the log so heavily that the wood swells, and this induces mushrooms of more than ordinary large growth. The collected mushrooms are dried by the heat of brazien, either carefully ranged in boxes placed on shelves in a barn, or strung on thin strips of bamboo. Dried mushrooms retain their flavor for a great length of time, and consequently bear transportation to any distance well. Ph. J. Trans., June 16th, 1877, p. 1026.

Ergot, Active Principle.—In his paper on the active constituents of ergot (see Proceedings, 1876, p. 120), Prof. Dragendorff had expressed a doubt that Tanret's "ergotinia" (ibid., p. 365) was a chemically distinct substance, but that it contained among other substances an admixture of sclererythrin. This statement has evoked from M. Tanret a rejoinder (J. de Pharm. et de Chim., Sept. 1876), in which he claims that his ergotinia cannot contain the least trace of sclererythrin. He had prepared the latter during the course of his experiments, obtained it pure, and studied its characters.

Sclererythrin, according to Tanret, is a red substance. Its alcoholic or ethereal solutions are of an intense reddish-yellow color. A trace of it is sufficient to give with dilute alkalies "a beautiful

murexid color." *Ergotinia* is nearly colorless, and does not give any color reaction with alkalies. If any alkaline solution of sclererythrin is treated with an acid and shaken with ether, the coloring matter passes into the ether. The contrary takes place with ergotinia; acids remove it from its solution in ether. As to the violet color which sulphuric acid produces with *scleroiodin*, it cannot be confounded with that characteristic of ergotinia. Sulphuric acid alone gives with the latter only a greenish-blue color; in order that the red-yellow color, followed by a magnificent violet-blue, may be manifested, it is necessary that the acid should not be too concentrated, but diluted with about one-eighth water, and, what is indispensable, with sulphuric ether, though of this there might not be more than a trace. Further, ergotinia is soluble in alcohol, chloroform, and ether, while scleroiodin is not. Ph. J. Trans., Sept. 23d, 1876, p. 249.

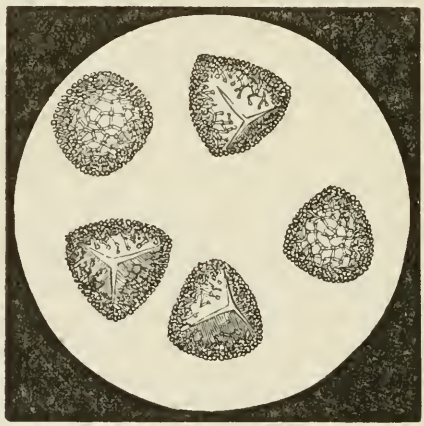
Ergot, Preservation.—Prof. Dragendorff thinks that the proneness of ergot to spoil by keeping is due to the oxidation of the fixed oil it contains so abundantly. The active principle of ergot, which, according to his investigations, is a nitrogenized organic acid united with lime, is considered by him as by no means unstable. Powdering the ergot causes the free exposure of the fat, which naturally abstracts oxygen, and becomes rancid. This oxidation, however, is preceded by ozonization, and care must be taken to prevent the ozone from attacking the active principle. Hirschberg, some years ago, suspected that the gradual oxidation of the fat was the primary cause of the deterioration of ergot. Prof. Dragendorff thinks that by depriving ergot of its fat immediately after powdering, and again drying, the resulting powder would retain its activity for a long time. New Rem., Feb. 1877, p. 46, from Jahresb. f. Pharm.

Ustilago Maidis.—The corn smut or ergot, which has been chemically examined by Mr. C. H. Cressler (A. J. Ph., 1861, p. 306) has been repeatedly recommended for medicinal use, and is again brought forward by Dr. C. Henri Leonard, who has used it in the form of fluid extract in a case of labor, and contrasts its action with that of ergot. The uterine contraction of the latter is regarded as tonic, that from ustilago seems to be regularly intermittent. It is given in doses of a teaspoonful, repeated in 10 minutes, and has proved serviceable in spermatorrhœa in doses of 10 to 20 drops. A. J. Ph., April, 1877, p. 189.

LYCOPODIACEÆ.

Lycopodium, *Microscopical Examination.*—The accompanying figure illustrates a description of the microscopic character of lycopodium, given by Mark W. Harrington, in his interesting serial on "Powdered Drugs under the Microscope." Each grain or spore is a three-sided pyramid, with a convex base. It looks as if it was cut out of a sphere by three planes, each of which passed through the centre. In one of the grains represented we are look-

FIG. 24



ing directly down on the apex of the pyramid. In two of the others we view the pyramid a little from one side. In the remaining two we are looking at the convex base of the pyramid. A groove runs down each angle from the apex. The true nature of the markings on the surface cannot be made out without some care. When carelessly pressed, the grains appear to be covered with hairs of peculiar shape, better seen at the edges. If the grains are flattened out by pressure, it is found that the markings are really rather irregular six-sided meshes. The same thing can be seen at a few points at a time, after the grains have been carefully brought into focus. Each grain consists of a single cavity or cell, surrounded by a double membrane. This is hard to demonstrate, but can sometimes be seen by crushing beneath the thin glass cover. The outer membrane or bag is thicker and brittle and bears the markings, the inner is thinner, more elastic, and smooth. Within the membrane is a thick liquid with drops of oil. The latter are easily rec-

ognized under the microscope. They have a spherical form, and appear bright, especially at the centre, because the light is highly refracted by them.

Lycopodium has the reputation of being frequently adulterated, but the author has found, among numerous samples examined, but one which was adulterated, this containing, however, fully one-third potato starch. He draws attention to the various adulterates which have been found from time to time, and the microscopic characters by which they may be recognized. A. J. Ph., Aug. 1876, p. 344.

FILICES.

Male Fern, Comparative Assay.—According to Kruse, the rhizomes collected in spring and fall are of a deeper green color, and have a stronger odor than those collected in summer. With a view to ascertain the variations in the composition of the rhizome collected at different seasons in 1874, comparative assays were made with the following results:

	RHIZOME COLLECTED		
	April.	July.	October.
Moisture of air-dry rhizome,	15.7	13.4	13.5
Moisture in powder kept in damp atmosphere,	24.5	23.7	28.1
Ashes of rhizome dried at 110° C. (230° F.),	2.2	2.5	2.5
Extract obtained first with water,	36.4	25.4	35.9
Extract obtained afterwards with alcohol,	21.6	22.8	8.5
Extract obtained first with alcohol,	27.3	26.1	39.5
Extract obtained afterwards with water,	14.7	17.0	10.7
Extract obtained first with ether,	10.3	12.4	11.5
Extract obtained with alcohol,	17.8	16.7	24.5
Extract obtained with water,	12.8	6.9	14.8
Extract obtained with gasolin (light petroleum ether),	9.3	8.4	9.1
Extract obtained afterwards with alcohol,	16.9	15.2	19.4
Extract obtained with rectified petroleum,	14.	11.4	17.2
Extract obtained with acetic ether,	4.9	5.1	4.9
Starch, determined as sugar,	28.2	22.7	15.4
Sugar,	1.0	1.4	2.8
Tannin, determined with acetate of copper,	4.6	6.9	5.9
Tannin, determined with acetate of lead,	9.2	9.8	11.7
Filix red, extracted by ammonia from rhizome, previously exhausted by water,	5.2	6.9	7.8
Mucilage and albumen, the alcoholic precipitate in the syrupy infusion,	5.25	2.35	2.13

The author found it impossible to obtain the whole amount of filicic acid present suitable for quantitative determination. Rhizomes collected in September, 1875, gave results in extracts, and in the composition of the ashes, agreeing closely with the results obtained from the October rhizome. The ashes contain between 19 and 20 per cent. of phosphoric acid, 10 to 11 per cent. silica, 5.5 per cent. sulphuric acid, and some chlorine and carbonic acid, combined with potassium, calcium, magnesium, iron, manganese, and sodium. A. J. Ph., Jan. 1877, p. 16; Arch. Ph., July, 1876, p. 24–32.

EQUISETACEÆ.

Equisetum.—According to Professor Landerer, several plants of this genus still enjoy in Greece, as they did in the olden time, a popular reputation in dropsy and various nephritic diseases. He has known them, more particularly E. hyemale and E. palustre, to be employed in connection with the herb of *Parietaria officinalis*, the *helxine* of the old authors, and which was also called *parthenion* or virgin's plant, *perdinion* or partridge herb, because partridges were supposed to like it, and sometimes *urceolaria*, from its use for the cleansing of glass vessels. The plants of the genus Equisetum were formerly called *hippuris*, meaning horsetail, the present botanical name meaning horsebristle. The two plants combined (Equisetum and Parietaria) were used with supposed good results in dropsical, phthisical, scrofulous, cancroid, and other chiefly incurable and contagious diseases. A. J. Ph., April, 1877, p. 156.

AROIDEÆ.

Amorphophallus Sylvaticus.—The local East Indian name of this plant is "Iangli Soorun," that of the tuberous root "Madan Murt" or "Kummer Kás." The latter, according to W. Dymock, is found in most of the shops in Bombay peeled and cut into segments, which are strung upon a string; the segments are about the size of those of an orange, of a reddish-brown color, shrunken and wrinkled, brittle and hard in dry weather; the cut surface is mammillated. When soaked in water they swell up, and become very hard and friable, developing a sickly smell like that of the spadix of the plant when in flower. A microscopic examination shows that the root is almost entirely composed of starch. Madan murt has a mucilaginous taste, and is faintly bitter and acrid; it is supposed to have

restorative properties, and is much in request. It is probable that the roots of the wild *Amorphophallus campanulatus* form a part of the commercial drug. The cultivated variety of the latter is largely used as a vegetable; under cultivation it loses its acridity, and grows to an enormous size. Ph. J. Trans., Aug. 26th, 1876, p. 172.

GRAMINACEÆ.

Triticum Sativum.—A. H. Church has made an interesting analysis of wheat, by which the difference in the chemical composition of the pericarp and embryo are very clearly shown; although, owing to the difficulty of obtaining a sufficient quantity of the parts of the seed in a pure condition, the analyses cannot be regarded as complete. They show, however, that the greater part of 70.51 per cent. of the pericarp is cellulose and lignose, whilst the embryo contains but 3.12 per cent. The latter also contains three times as much fatty substances, and three and a half times as much albuminoids as does the pericarp. A similar difference is shown in the quantities of phosphoric acid contained in the ash of the respective parts; that of the pericarp containing 15.3 per cent., while that of the embryo contains 60.58 per cent. Their composition, as tabulated by the author, is as follows:

Pericarp: Water, 15.17; fat, 1.31; albuminoids, 10.37; cellulose, lignose, starch, dextrin, etc., 70.51; ash, 2.64.

Embryo: Water, 12.53; fat, 4.18; albuminoids, 35.70; cellulose and lignose, 3.12; starch, dextrin, etc., 38.71; ash, 5.76. Arch. Ph., Jan. 1877, p. 64, from Jour. of Botany.

Indian Corn, Presence of a Poisonous Alkaloidal Body in the Mildewed Meal.—It has been observed that among the rural population of the Lombardian plains, after the long-continued use of bread containing a portion of Indian meal, sporadic ailments frequently have occurred, which very often proved fatal in their character. The cause for this has been sought for, and is probably due to the production of a fungoid growth, the Indian meal, as well as the bread baked with it, being peculiarly liable to the formation of mildew. A. Gombroso had already, in 1871, proven that the extract of mildewed maize meal exercised poisonous action upon man and animals, and Brugnateli and Zenoni have recently obtained from such mildewed meal, by the method of Stas-Otto, an alkaloid-like body. This alkaloid substance has now been investigated by Balbiano, who describes it as a white, readily change-

able, non-crystalline body, which is insoluble in water, but readily soluble in alcohol and in ether, forming alkaline solutions. It is a remarkable fact that its solution in sulphuric acid, upon the addition of oxidizing agents, produces a blue-violet color, which resembles that of the corresponding strychnia reaction very closely. The reaction takes place as readily with sulphuric acid containing traces of the oxides of nitrogen. Ph. Central H., Nov. 30th, 1876, p. 410.

Coix Lachryma, Local Name in India "Kassai Bij."—W. Dymock states that the silicious involucre of this grass containing the seed is sold in the drug shops of Bombay, being used as a diuretic. The drug is about the size, and has much the appearance, of a small cowrie shell, shining, white, and very hard. At the base is a scar marking the attachment of the peduncle; at the apex an opening, from which, even in the dry state, a portion of the female flower may be seen protruding. In the fresh state a spike of male flowers from one to two inches long rises from it. Ph. J. Trans., Jan. 6th, 1877, p. 549.

PALMACEÆ.

Dates, their use in the Orient.—Prof. X. Landerer states that during the months of November and December the markets of the Orient are supplied with dates from Alexandria, Cairo, and other parts of Africa. These are mostly purchased by well-to-do families only, as they are dear in proportion to other fruits, the oke ($2\frac{3}{4}$ pounds) of fine-flavored and perfect dates—which are called *churmades*—costing as much as four drachms (about 75 cents gold). The kernels of the fruit may be found lying about on the streets of Egyptian cities in astonishing quantities; these, as well as apricot kernels, are generally collected by poor people, who roast and grind them, and prepare from them a sort of "coffee," of quite pleasant taste, which is very commonly drank in the small coffee-houses by the poorer classes. In Mecca and Medina, during the height of the annual pilgrimage, when as many as 100,000 pilgrims are sometimes present, this kind of coffee is sold to them in immense quantities by the Kaffetzyo, at the rate of two tanadys the cup. A good housewife is said to be able to prepare thirty different kinds of dishes from dates. Egypt exports also, as delicacies, date bread, date confection, and date sherbet. The latter is mostly sent as a present to absent friends. The confection is prepared from dates which are mixed with nuts pounded in the saccharine

juice of the date, or with pounded mann-fruit, that is, the root of *Cyperus esculentus*. The latter are likewise brought from the Orient during the winter months, under the name of mana-mana, and are sold at three leptas per oke. They have a very agreeable taste, resembling chestnuts or almonds, and are used for baking a special kind of bread, or for preparing a delicious sort of almond milk, or else are expressed to procure the fixed oil which they contain. New Rem., Jan. 1877, p. 22.

ASPARAGINEÆ.

Asparagus Ascendens?—Under the name of "Suffed Moosli" the dry tubers of this plant are, according to W. Dymock, found in the Bombay shops. The author has not seen the plant, and therefore places a query after the botanical name. The drug consists of shrivelled decorticated tubers, from two to two and a half inches long, the largest being about a quarter of an inch in diameter. They are of an ivory-white color, often twisted, hard, and brittle. Adhering to some of the pieces may be seen portions of a yellowish epidermis. When soaked in water they swell up and become spindle-shaped, the thickest part being about the size of a lead-pencil. Under a microscope these tubers present a delicate cellular structure, the cells of which contain nothing but a little fine granular matter. This surrounds a central vascular column, the middle part of which is entirely occupied by jointed vessels, the outer portion consisting of scalariform. The portions of adherent epidermis already mentioned are silicious. Suffed moosli has an agreeable mucilaginous taste; it contains no starch. The author has used it largely as an article of diet, for which purpose it is far nicer than Salep, and is generally relished by Europeans. To prepare it, take 200 grains of the powder, 200 grains of sugar, pour upon them a large teacupful of boiling milk, stirring constantly.

Two varieties of asparagus are found in the neighborhood of Bombay, *A. sarmentosus*, which has a woody root-stock, to which are attached a number of ovate tubers, and *A. racemosus*, having also a woody root-stock and bearing a large number of fleshy vermicular tubers. The local name of the first is "Makhee," of the second "Satawree." Ph. J. Trans., Oct. 14th, 1876, p. 310.

Smilax Ovalifolia.—According to W. Dymock, the roots of this smilax, locally called "Gootee," is the sarsaparilla of the Portuguese and is kept in all the drug shops in Goa. It does not appear to be

used in Bombay. It is a climbing shrub, which is very common in the Concans. The roots are very numerous, and have a general resemblance to sarsaparilla. A section shows a dry, suberous, brown bark; secondly, one row of five-sided cells which are more or less wedge-shaped, their nuclei being situated towards the apices; thirdly, a range of numerous rows of ovoid cells, variable in size, with central nuclei; these extend as far as, and partially surround, the vascular zone, which consists of large vessels with generally two smaller ones in contact with them. Within the vascular zone the central portion of the root is made up of large thin-walled cells filled with starch or red coloring matter. The latter is most abundant in young roots. Ph. J. Trans., March 10th, 1877, p. 730.

LILIACEÆ.

Aloe Sp.?—W. Dymock states that many varieties of aloes are met with in the Bombay market, among which, excluding socotrina aloes, a variety known as Jafferabad aloes and locally called "Elia," is the kind most worthy of notice. It is manufactured in a town of that name on the Kattiawar coast, belonging to the Hubshis of Jinjeera, a family of African origin. The author has not yet been able to get an authentic specimen of the plant which yields the drug. This occurs in form of a black mass; it has a glassy fracture; thin pieces are yellowish-brown and translucent; the powder is dull yellow, the odor powerfully aloetic with some aroma; when treated by Histed's process for aloin it affords a fair yield. The aloin when brought into contact with nitric acid gives a deep red color, which is permanent; tested with sulphuric acid and afterwards exposed to nitric fumes, no change of color takes place. Its reactions are then the same as barbaloin; they may be obtained with the crude drug, which is remarkably free from impurities. Jafferabad aloes may well replace Barbadoes aloes in India. Ph. J. Trans., Dec. 2d, 1876, p. 451.

Asteracantha Longifolia.—According to W. Dymock, the seeds of this plant, locally called "Talmakhara," are very generally used and are to be found in every druggist's shop in Bombay. They are small, flattish, of irregular form and brown color, the largest one-tenth of an inch long, one-sixteenth broad. When placed in the mouth they immediately become coated with a tenacious mucilage, which adheres to the tongue and palate, and is of rather agreeable flavor. When a section of the seed is placed under the mi-

croscope with a drop of water the development of the mucus may be observed. It appears to spring in filaments from the columnar cells of the testa; these spread rapidly in every direction, and form a network which resembles the growth of some of the lower forms of algæ. It does not dissolve when much water is added. Talmakhara (vulg. Talimkhana) seed is considered to be very efficacious in the concoction and increasing the quantity of the seminal fluid; it is diuretic. The powdered seed is administered with sugar or milk in doses of from one to three drachms. Ph. J. Trans., Dec. 16th, 1876, p. 492.

AMARYLLIDACEÆ.

Agave Americana, Lin.—F. M. Murray describes the plant, its habits, modes of propagation, etc., and draws the distinction between it and other species of the genus Agave. He cites the authority of Henry Perrine (U. S. Consul at Campeche in 1833) and of M. Bazire, and maintains that the plant which yields the pulqué of Mexico is distinct from Americana, and is properly named A. Mexicana. The plant was brought to Key West by Mr. Perrine in 1838, and was then introduced to Indian Key, Cayo Layo, and the mainland, where it grows as far north as lat. 38°. It grows also in Southwestern Texas and in Southern New Mexico. The growing plant is used for hedges; the dried-flower stems constitute a thatch which is impervious to rain, while the split stem forms an excellent razor strap. The most important product, however, is the fibre obtained from the leaves. The methods of separating these are as yet imperfect, yet considerable quantities are used in constructing cordage of various kinds, bagging, etc. The difficulty of its production consists in the want of a ready means of separating the tenaciously adhering pulp, a rather coarse, silky-white fibre, harsher and not quite so strong as manila being produced. 75 to 100 leaves are yielded by a single plant; thirty tons of leaves produce about one ton of fibre. The removal of the pulp from the fibre may probably best be accomplished by improving upon the idea of Mr. G. V. Allen, of Key West, to express the juice (which may be fermented for the 10 per cent. of alcohol which it will yield), then to macerate the expressed leaves in water for a time, to dry them, to shake off the pulp, etc., etc. Medicinally the juice (fermented?) has been used with success by Dr. Perin, of the U. S. Army, in the treatment of scurvy. The pulp has been used as a rubefacient in veterinary practice, and was recommended by

Lenoble as an epispastic. The juice is said to have laxative, diuretic, and emmenagogue properties. A. J. Ph., July, 1876, p. 301.

Agave Americana is now, according to X. Landerer, quite common in Greece and other Oriental countries. At the Olympia Exposition, held a few years ago at Athens, elegant fabrics for ladies' wear were exhibited, and much admired, which had been made from the textile fibres of this plant. This industry is carried on in the Ionian Islands, mainly in Zante and Cephalonia, and gives employment to many women and children. An extract prepared from the leaves is medicinally employed to some extent. A. J. Ph., April, 1877, p. 157.

IRIDACEÆ.

Iris Versicolor.—Carl H. Marquardt found the root of Iris versicolor to contain: *oily matter*, having a light color and a pleasant, bland taste, becoming after a time acrid; *soft resin*, possessing an acrid taste in a very marked degree, and yielding with nitric acid a beautiful purple-colored mass; *glucose;* a *yellow substance*, having a peculiar, not unpleasant, bitter taste; *albumen; gummy matter; starch.* On distilling the fresh rhizome with water, a white *camphoraceous substance* was obtained, which was scaly in appearance, had a faint odor, was nearly tasteless, and was soluble in alcohol. A. J. Ph., Sept. 1876, p. 406.

AMOMEÆ.

Zingiber macrostachyum, a plant resembling ginger, but larger, is locally known in Bombay, according to W. Dymock, by the name of "neesun;" it is common in Konkon, and is used as a popular remedy in diarrhœa and colic. The stem and the under surface of the leaves are pubescent, spikes several, with long peduncles. Flowers yellowish-white, middle lobe of lip marked with diverging purple lines. Fruit ovate, pubescent, red, about one-half inch long. Rhizome one to two inches in diameter when fresh, jointed, compressed, with numerous radicles, each joint furnished with a bud. Epidermis scaly, light brown. Cut surface of the fresh root a rich golden-yellow. Odor powerful, like a mixture of camphor and turmeric; taste hot and camphoraceous. Under the microscope the epidermis is seen to be formed of many layers of compressed and obliterated cells. The parenchyma consists of large polyhedral cells; those in the cortical portion of the root are

nearly free from starch, but those in the central portion are filled with large ovoid starch-granules. In all parts of the rhizome large cells full of golden-yellow essential oil abound. The vascular system resembles that of turmeric. Ph. J. Trans., Oct. 28th, 1876, p. 350.

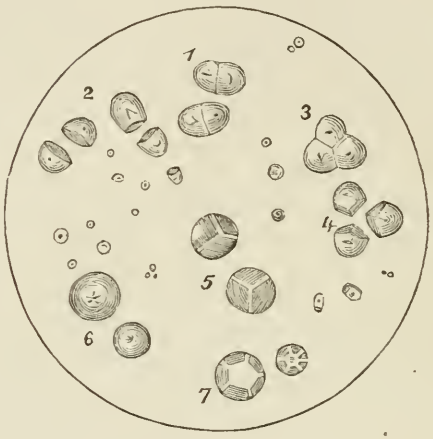
Canna Indica, *C. Lutea*, *C. Discolor*.—The local Indian name of these plants, all of which are found in the Bombay gardens, is "Kimuski." *C. lutea* is stated in the "Bombay Flora" to be the source of tous-les-mois. W. Dymock has examined its starch and finds it to correspond exactly with the commercial article, but has never known the starch to be prepared in Bombay. The rhizomes of *C. indica* and *C. discolor* yield a similar starch, but they also contain a good deal of coloring-matter, from which the rhizome of *C. lutea* is almost free. Ph. J. Trans., Dec. 2d, 1876, p. 461.

Arrowroot.—T. Greenish, basing his opinion on information received from some old Brazilian residents, believes that there is just ground for the assumption that the term "arrowroot" is derived from the Indian word "ara-ruta," a term signifying "mealy root." He believes, furthermore, that the term arrowroot did not originally apply to maranta starch alone, but that cassava starch has equal claims to it; indeed it is probable that the term was applied to other starches which had been found capable of preparation so as to become an acceptable article of diet, and the author mentions as instances, Brazilian arrowroot (manihot); Tahiti arrowroot (tacca); Portland arrowroot (arum); and East India arrowroot (curcuma). The author thinks that the time has arrived when the terms arrowroot, tapioca, etc., should be dropped in published documents connected with adulterations or otherwise, and the term "starch" used instead in a generic sense to designate the organized structure, and its source added to distinguish the particular kind; thus, the starch of a maranta or the starch of a manihot; the starch of wheat or that of potato.

The author furthermore draws attention to the circumstance that for some time maranta starches have been imported adulterated with cassava starch. The starch of the manihot, commonly called cassava starch, is readily recognized under the microscope; see the accompanying cut (Fig. 25). The granules are for the most part muller-shaped, with a fair sprinkling of the circular; some of the muller-shaped have truncate, others dihedral bases. If the starch be examined *in situ*, as in the meal of the cassava, there

will be found a good many doublets and triplets, as shown in the drawing, but these combinations are rarely present in a commercial sample of the prepared starch. The separation of the grains composing the doublet gives the muller-shaped truncated granules,

Fig. 25.



and that of the triplet the muller-shaped with dihedral bases. The diameter of the granules ranges from 0.008 to 0.022 m.m.

The starch of the tacca, called Tahiti arrowroot, is one resembling that of the cassava, but it is rarely found in commerce; the muller-shaped granules are, however, larger, and there are not proportionately so many circular ones. The diameter ranges from 0.026 to 0.045 m.m. The only other starch of this form is that of the *Castanospermum Australe*, or Moreton Bay chestnut. It was shown at the Paris Exhibition, but from that time to the present has not appeared as a commercial article. The author believes that all the cassava of commerce is the produce of *Manihot utilissima*, Pohl. Ph. J. Trans., Aug. 26th, 1876, p. 169.

ARISTOLOCHIACEÆ.

Aristolochia Indica.—The root and stem of this plant, which is locally known as "Sapsun," constitutes, according to W. Dymock, a drug of the Bombay shops. It is in pieces about three inches long and one-quarter inch or more in diameter, and has a central woody column made up of about ten wedge-shaped portions. The

bark is thick and corky, marked with longitudinal ridges and numerous small warty projections; it is of a yellowish-brown color. Under the microscope the central wood is seen to be traversed by large vessels; the medullary rays are distinct, and easily traced into the bark; in the latter, which consists of a corky parenchyma loaded with starch, there is a circular zone of large, yellow, stony cells. Sapsun is very bitter, and has a pungent, camphoraceous taste. The plant grows in the neighborhood of Bombay, and the drug is kept in all the shops, being used as a stimulant tonic. An alcoholic tincture yields a quantity of yellow, bitter resin, and some yellow coloring-matter, soluble in water. The leaves, stem, root, and ripe capsules of

Aristolochia bracteata, locally known as "Keeramar," constitute another drug of the Bombay shops. The portions of stem are striated, slender, and about as thick as a piece of whipcord; the root is of the same size, but not striated; the leaves are reniform, glaucous when fresh; the capsules are ovate, three-quarters of an inch long, ribbed, depressed at the apex, six-celled; each cell contains a column of heart-shaped flat seeds, closely packed. The appearance of the seeds is peculiar; they look as if they had been cut out with a punch; one side is flat, black, and rough from a number of irregular projections; the other is almost entirely occupied by two brown, comparatively lobular projections of a soft, corky structure; these, under the microscope, are seen to be entirely made up of ovate, empty, dotted cells. The whole plant is nauseously bitter, and is much used as an anthelmintic. It is also reputed to possess antiperiodic properties, but this requires investigation. Ph. J. Trans., Oct. 14th, 1876, p. 310.

THYMELEÆ.

Conocarpus Latifolius.—According to W. Dymock, the tree locally known in India under the name of "Davra" or "Dawara," is common in Concan and Khandesh. It furnishes a gum which occurs in vermicular pieces, very slightly colored, translucent; it tastes like gum arabic, is very readily soluble in cold water, and forms an almost colorless mucilage, possessing a faint, peculiar odor. Ph. J. Trans., Aug. 26th, 1876, p. 172.

LAURACEÆ.

Sassafras, Antagonistic Properties to Vegetable Poisons.—Dr. A. W. T. Lyle draws attention to the statement of Dr. Thompson, of

Nashville, concerning the antagonistic properties of sassafras to henbane and tobacco. Dr. Lyle mentions the case of a child, four years old, who had eaten stramonium flowers, and showed symptoms of poisoning. After the administration of emetics, ten drops of oil of sassafras were given every half hour until six doses had been taken, when consciousness returned and, after taking a dose of oil, the patient recovered completely. New Rem., Sept. 1876, p. 270, from Cin. Lanc. and Obs.

Tetranthera Roxburghii, *Local Name in India*, "*Maida Lakri*."—W. Dymock states that the bark of this tree is a well-known drug, and is found in every shop in Bombay. The bark varies in thickness from one-tenth to three-tenths of an inch; externally it has several layers of whitish, scabrous, corky tissue, the remaining portion being of a chocolate-brown color. A microscopic examination shows abundance of reddish-brown coloring-matter in the parenchyma, and numerous liber and stony cells; there are no distinctive characteristics. The odor of the bark is feebly balsamic; its most remarkable property is the large quantity of mucilage which it affords when moistened; this has a bland taste, with a faint agreeable aroma. If the bark has been long kept the aroma disappears, but the mucilaginous qualities remain unimpaired. Its chief use is as a stimulant and astringent in affections of the bowels, such as dysentery. Ph. J. Trans., Jan. 6th, 1877, p. 550.

POLYGONACEÆ.

Rhubarb, *Cultivation at Banbury*, *England*.—Hanbury, in "Pharmacographia," attributes the plant cultivated at Banbury to *Rheum rhaponticum*. L. E. M. Holmes has recently had opportunity to visit Banbury and to examine the plant as cultivated there, and he is of the opinion that the plant is a hybrid, bearing some resemblance to *R. rhaponticum* and *R. undulatum*. The plant is chiefly cultivated in a rich, red, friable loam, the young plants being always propagated from the lateral shoots of plants about four years old, and are never obtained from seeds. The petioles are never gathered for food, because it has been found that so doing injures the size and the quality of the root. The young plants are set at distances of three feet apart, and the root is not fit for collection until the plants are about four years old, after which they improve in size and quality until nine or ten years old. The four year old plants yield from one and a half to two, the ten

year old plants about five tons of dried root per acre. The drying is by no means an easy task. The roots, dug up during hot weather at any time between July and October, are exposed for two weeks to a current of air on wicker baskets under a covered shed; they are then exposed to heated air for about six weeks in a drying-room, a process requiring great care lest the outer portion should dry too rapidly, while the interior is still moist. The large central portion furnishes the pieces known in trade as "fine large flats" and "fine large rounds." The "small rounds" and the cuttings, known as English "stick" rhubarb, are obtained from the side branches of the root. Some of the flat pieces, except for their shrunken exterior, are not unlike the East India rhubarb of commerce, and being more thoroughly dried and harder in the centre, seem to meet with greater demand than the rounds. The raspings obtained in trimming the pieces are ground into powder. The average annual yield of dried root is from eight to ten tons.

Rheum officinale is now being experimented with, about forty large plants between two and three years old and about 200 seedlings being under cultivation. These plants are truly magnificent, each plant occupying a space of from eight to twelve feet square, and standing four to five feet high. The root of only one plant has as yet been dried, and was obtained from a plant barely two years old. In color the dried roots are paler, although the veins are darker, than in the East India rhubarb; nevertheless it is stated to yield a bright yellow powder. The external markings do not exactly correspond with those of the East India rhubarb, the peculiar reticulated appearance characteristic of that sort not being visible on the two samples which the author has seen. This may, however, be due to the age of the root, and it remains to be seen whether older roots present a different aspect. Ph. J. Trans., June 16th, 1877, p. 1017.

AMARANTHACEÆ.

Achyranthes Aspera, *Local Name in India* "*Aghara*."—A common weed used medicinally by the natives of Bombay; it is used in decoction as a diuretic, and the juice as an application to scorpion stings and to relieve toothache. The weed has an erect striated pubescent stem, generally about two feet high, but sometimes much more. Side branches in pairs, spreading; leaves pubescent from the presence of a thick coat of long simple hairs; obovate, undulated, very obtuse, acuminated; base attenuated; petiole short.

Spikes long, lax; flowers green; bracts rigid, prickly. Sections of the stem do not show any crystalline deposit in the parenchyma. Ph. J. Trans., Jan. 6th, 1877, p. 549.

PLUMBAGINEÆ.

Plumbago Rosea.—W. Dymock draws attention to the root-bark of this plant, locally known in Bombay under the name of "Lal Chitra," which he thinks might be used as a substitute for mezereon in India, in the linim. sinapis comp., and in decoct. sarzæ comp. The active principle, plumbagin, being soluble in ether, an ethereal extract might be made. The root-bark is reddish-brown externally, transversely fissured, thick and tuberous; internally it is white when first removed, but soon turns red upon exposure to the air. It has a rancid heavy odor. A section of the root shows a central woody column, with a very large vascular system, surrounded by a bark almost entirely made up of thin-walled parenchymatous cells, loaded with large oil-globules and some starch. There is a good summary of the medicinal uses of this drug in the Pharmacopœia of India. Ph. J. Trans., Sept. 2d, 1876, p. 190.

Cyclamen Europæum and Hederæfolium.—The tuberous roots of these plants, according to Landerer, have been used in the olden time and are still employed by the peasants as a remedy in scrofulous affections; the root, radix cyclaminis, s. arthanitæ of older pharmacy, is popularly called *swine-bread*, being dug up and devoured by these animals. The herdsmen of Greece eat it for its purgative properties. In ancient times the flowers were used for garlands, and the plant, having been consecrated to Bacchus, the wine goblets were surrounded with the leaves of the *kissos*, ivy, and the flowers of the kyklamis. A. J., Ph., April, 1877, p. 155.

SCROPHULARIACEÆ.

Digitalis purpurea, Presence and Extraction of a Natural Ferment.—Under "Albuminoids" in this report, reference is made to a natural ferment, found by C. Kosmann in the buds, flowers, or young leaves of certain plants; among the latter the young leaves of digitalis are mentioned as containing this ferment, which has the power of converting cane-sugar into glucose, starch into dextrin and glucose, and digitalin into digitalretin and glucose. The latter transformation takes place when an infusion of digitalis leaves is exposed to sunlight. The author gives the following method for

its extraction and purification: To an infusion of the young and fresh leaves, its own volume of strong alcohol was added. After twelve hours the grayish-white precipitate which had fallen was collected, washed, and dried. It was then redissolved in water, the solution filtered from a little insoluble matter, and again precipitated by the addition of alcohol. The white precipitate was washed with alcohol and then dried on glass. The dry substance was grayish-white, granular, soluble in water, and was not rendered blue by iodine. Under the microscope it presented the appearance of granules adhering to one another. It possessed eminently the power of decomposing cane-sugar, starch-paste, and soluble digitalin, acting thus quite as energetically as a strong infusion of the leaves. Ph. J. Trans., May 5th, 1877, p. 894, from Jour. de Ph.

Gelsemium Sempervirens.—C. Robbins has made a series of very interesting experiments upon the active constituents of *Gelsemium sempervirens*, the substance of which has been communicated to the Berlin Chemical Society by Prof. Sonnenschein, in whose laboratory the experiments were made. The author has established the identity of the *gelseminic acid* (first noticed by Wormley and believed by him to be an acid because of its acid reaction, and because its compound with an alkali produces precipitates in the solutions of most of the heavy metals) with *æsculin*, obtained from *Æsculus hippocastanum*. The alkaloid, *gelsemia*, was also isolated in the pure state, and its ultimate composition was determined to be $C_{11}H_{19}NO_2$ (O = 16). It completely neutralizes acids, but appears to be incapable of forming crystallizable salts. The hydrochlorate gave a white precipitate with tannin when in concentrated solution, but in dilute solution only after the addition of ammonia; chloride of gold a yellow precipitate, not altered by heating; iodine in KI a flocculent red-brown turbidity, conglomerating upon heating; iodo-hydrargyrate of potassium a white flocculent precipitate, soluble by heat, and reprecipitated on cooling; phosphomolybdic acid, a flocculent yellow precipitate; bichloride of platinum, an amorphous citron-yellow precipitate, soluble in water, especially on heating. The pure alkaloid dissolves in concentrated nitric acid with a yellowish-green color; in concentrated sulphuric acid with the same color, changing immediately to reddish-brown, and upon heating to a dark dirty red. If it is dissolved in conc. sulphuric acid, and bichromate of potassium be added, it takes, especially at the line of contact, a cherry-red color, changing a little to violet, which soon forms a bluish-green spot. If, instead of bichromate of

potassium, ceroso-ceric oxide is added to the sulphuric acid solution, there is produced a bright cherry-red color, especially at the point of contact, which by stirring is diffused through the mass. This reaction takes place so sharply with the smallest trace that it may be looked upon as the best test for the presence of gelsemia. Ph. J. Trans., Sept. 30th, 1876, p. 270.

SOLANACEÆ.

Henbane, Cultivation at Banbury, England.—Mr. Holmes has been furnished by Mr. Usher, of Banbury, some interesting information regarding the cultivation of henbane. The biennial variety is the only one cultivated, and appears to be preferred to the annual on account of the greater size of its leaves. Notwithstanding the statement of Hanbury that there is scarcely any distinctive character, except that the one is annual and the other biennial, Mr. Holmes finds that there is something very distinctive in their habit. The biennial plant grows to a height of two or three feet, is abundantly branched, and its leaves, which are twice as long as those of the annual variety, are deeply cut, while the terminal lobe of the leaf is long and rather narrow. The leaves of the upper branches, however, resemble when young those of the annual variety, being shorter, and having the leaf much broader and more triangular, not lanceolate, as in the stem leaves. The cultivation of the plant appears to be beset with many difficulties.

The plants are collected for drying about the third week in June. The upper leaves are deprived of their midrib, and these, as well as the flowering tops, are dried, and form the best biennial henbane of commerce. The lower leaves and stems are expressed, and the juice evaporated to extract. The drying of the leaves and flowering tops is done in malt-kilns. They are spread out thinly, and are turned over two or three times a day. As one lot becomes partially dry, it is transferred to another kiln until quite dry, which usually requires three days. Ph. J. Trans., June 16th, 1877, p. 1018.

Hyoscyamus, Stramonium, and Belladonna, Forensic Determination of their Alkaloids.—S. Wasilewsky has experimented with a view to determine the best solvent for the alkaloids of these narcotic plants in connection with the method of extraction suggested by Dragendorff, and finds chloroform to be superior to either benzole or ether. Operating upon 720 grams of the leaves of the above-

named plants, he mixed them with flour and fat, and extracted the mixture with acidulated water by digesting for twenty-four hours, at a temperature of 50° C. (= 112° F.), and expressing, treating the residue once more in the same manner. The united liquids were evaporated on a water-bath to syrupy consistence, the syrupy liquid mixed with three times its volume of alcohol, and filtered after standing twenty-four hours. The alcohol was distilled off, the aqueous residue agitated with petroleum ether until this remained colorless, and was then rendered alkaline with ammonia; after which it was shaken twice with benzole, ether, or chloroform, according to the experiment, and evaporated to dryness. The results were as follows:

720 grams yielded to	Benzole.	Ether.	Chloroform.
Hyoscyamus, .	0.006 gm.	0.003 gm.	0.108 gm.
Datura stram.,	0.003 "	0.005 "	0.376 "
Atropa bellad.,	0.005 "	0.008 "	0.410 "

In each case the author determined that the aqueous liquids had been perfectly deprived of their alkaloidal constituent. Neither petroleum ether, ether, amylic alcohol, or benzole are capable of removing any portion of the respective alkaloids from their *acid solution;* chloroform, however, was found capable of dissolving traces, and should, therefore, not be employed for removing resinous matter, etc., from the acidified extractions of the plants. Ph. Zeitschr. f. Russ., No. 21, 1877, p. 641.

Atropa Belladonna, Presence of a Fluorescent Body.—According to Richter, all parts of Atropa belladonna contain a peculiar blue fluorescent body, which is remarkable both for its great stability and the fact that it may be recognized even in very highly dilute solutions. R. Fassbender has found it to be present in all commercial extracts of belladonna which he has had opportunity to examine. The following experiment bears evidence that extremely small quantities of this peculiar body may be recognized, and affords at the same time a method for its isolation: Two unripe berries of Atropa belladonna were washed with water, and the whole evaporated on a water-bath; the residue was exhausted with alcohol, filtered, evaporated, and the residue again taken up by water. The filtered solution, which reddened sensitive litmus-paper very distinctly, was digested with animal charcoal, which absorbed the peculiar coloring-matter, and again yielded it to warm alcohol, to which a few drops of ammonia had been added, the filtrate show-

ing distinct fluorescence. When this was diluted to 200 c.c., the fluorescence was still distinct when the liquid was viewed from above; even 5 c.c. contained in a narrow test-tube showed the fluorescence plainly. Its solutions may be evaporated to dryness, when, if the dry mass is treated with ammonia, it will again show the peculiar fluorescence. The fluorescent body is accompanied by a yellow resinous body, which is readily soluble in alcohol, but very sparingly in water. Ph. Centr., Nov. 16th, 1876, p. 393.

Datura Sp.?—Under the name of "Gharbhuli," the immature capsules of a kind of thornapple threaded upon a string, are, according to W. Dymock, found in the Bombay shops, and are said to be imported from Arabia. The capsules are light brown, and thickly set with longish prickles. They are about three-quarters of an inch long. Sometimes the peduncle remains attached. They do not correspond with the immature fruit of the Indian varieties which grow about Bombay. The native name, which means forgetfulness of home, indicates their physiological action. Ph. J. Trans., Jan. 6th, 1877, p. 550.

Pitury, an Australian Rival to Coca.—In a recent communication, Baron von Mueller states that the natives of Central Australia chew and masticate the *pitury leaves* to invigorate them during their long journeys through the deserts, just as coca leaves are used in South America. Those living near the Barcoo travel many days' journey to obtain the precious foliage, which is broken into small fragments, and carried about by them in little bags. It is also employed to excite courage in warfare. After some years' efforts to obtain a specimen of the plant, he has now received some leaves, and has with certainty determined them to belong to *Duboisia Hopwoodii*, F. Muell, a bush referred to the order *Solanaceæ* or *Scrophulariaceæ*, which grows sparingly in the desert scrubs, from the Darling River and Baracoo to West Australia. Ph. J. Trans., April 28th, 1877, p. 878.

OLEACEÆ.

Olea Europæa, Febrifuge Principle in the Bark.—L. Thibon prepares a principle—*oliverin*—from the bark of the olive tree, as follows: The aqueous decoction of the bark is evaporated to a syrupy consistence; this is precipitated by strong alcohol, and the filtrate again by oxalic acid. The filtrate from the last precipitate deposits the oliverin on slow evaporation. After washing with

cold water it forms yellow granules, which are slightly odorous and very brittle. Dr. Fabry reports remarkable cures with this substance, which is given in the dose of 0.10 to 0.30 gram four or five times a day in all cases where quinia is indicated. A. J. Ph., Dec. 1877, p. 358, from Rép. de Ph., 1876, p. 558.

Olives, Cultivation in California.—California, which is already famous for its luscious grapes, juicy pears, and giant apples, appears to be destined to become the American home of the olive. According to "Am. Grocer," the finest olives grown anywhere are said to be those produced at the San Diego Mission, and altogether the fruit is pronounced far superior, when carefully picked, to that raised in France or Spain. The olive tree is not particular as to its soil, and is easily cultivated. It is propagated by cuttings from other trees. It grows slowly at first, begins to bear at four years of age under favorable circumstances, but does not yield a full crop until the tenth or twelfth year. There is scarcely a limit to the length of time which the tree will bear, as a tree over seventy years old is said to have yielded 100 gallons of fruit. The average crop expected, after the trees have arrived at the age of maturity, is at the rate of 25 gallons per tree. Experience has taught that sixty trees are the most that an acre of ground can give sustenance to. The only enemy of the tree which has appeared so far in California is the gopher, which appears to attack the roots of the young sapling.

It is said by the proprietors of olive orchards that it is more profitable to make the fruit into oil than to pickle it. From five to seven gallons of ripe olives yield one gallon of oil, the machinery used for pressing being very simple, and stands in the orchard, protected from the elements only by a slight shed. The pulp is crushed from the pits of the olives, and stuffed into strong rope nets, which are then pressed, the oil running down into a tub of clear water, upon the surface of which it collects. The refuse and crushed seeds, on pressure, yield a quantity of oil of a lower quality, which is boiled in order to clarify it. The first does not need bleaching. (See also "Proceedings," 1873, p. 215.) New Rem., Nov. 1876, p. 326.

Olives, Culture in Greece.—X. Landerer communicates the following on the olive culture in Greece to "New Remedies," Jan. 1877, p. 22: The quantity of the annual production of olive oil in Turkey and Greece cannot be exactly stated, as no statistics are available, and no sort of care, either by measuring or by irrigation,

is bestowed upon this valuable tree; besides, for many centuries there has existed a popular notion that the olive tree, like some other wild fruit trees (as, for instance, *Quercus agilops*, Willd., which furnishes the so-called balanidia ore valonias), produces abundant crops only in every alternate year, and does not require special cultivation. In prosperous seasons Greece, together with the Ionian Islands, especially Corfu, can produce from 12 to 15 million okes (1 oke $= 2\frac{3}{4}$ lbs. avoird.) of olive oil, of which about 10 million are exported. Turkey in Europe and Asia Minor, with the rich islands of Mitylene, Chios, and Crete, produce annually about 50 million okes, of which some 30 million are exported. Regarding the quality of this oil, as produced in Greece or Turkey (where it is called *Zaitoun yāghi*, vulg. *Zaitoun-yagh*), it must be acknowledged that it cannot replace the best French or Italian olive oil for table use, but, nevertheless, millions of people use this oil for culinary purposes, chiefly as a substitute for the much more expensive butter. If the Greek oil were prepared by cold expression and filtered, it would be not only quite equal to Provence or Lucca oil, but would probably be preferred to the latter as being a purer and more natural product. Therefore the author appeals to all those who are especially interested in the production and sale of olive oil, to cause factories to be established in Greece or Turkey for the manufacture and export of pure olive oil, which could not fail to yield handsome profits.

Millions of pounds of inferior oil are used in the manufacture of soap, and for industrial purposes. Such soaps are generally marked with a Turkish monogram, as, for instance, the Cretan soap, *Kreticon saponni*, which has an excellent reputation in all parts of the Levant, as well as in Europe. Large quantities of "pyrinclaron," an oil which is obtained by exhausting the olive kernels with bisulphide of carbon, have also been made use of, of late years, in the manufacture of soap. Formerly these kernels and other residues, which yet contained 3 to 5 per cent. of oil, were thrown away as useless, or used as fuel for heating the water in the oil mills. The recovery from this waste product of the residuary oil has been of great importance to Greek industry.

Grecian Manna.—Prof. X. Landerer draws attention to two varieties of manna familiar in Greece. The first of these,

Alhagi manna, is the saccharine exudation of Hedysarum alhagi, s. Alhagi maurorum. Camel-drivers state that camels like the

plant, and eat the tops of it, and that the excretion of manna is thereby increased. The substance has been described by the older writers under various names, such as mel aëre, man arabum, mana hebraica, honey of St. John the Baptist, etc.

Tamarisk manna has some resemblance to the preceding. It is eaten with bread, and is produced by the puncture of an insect, Coccus manniparus, upon the branches of Tamarix mannifera, which grows in the peninsula of Sinai. It is principally collected by the monks of a monastery, who distribute it to the pilgrim visitors. A. J. Ph., April, 1877, p. 156.

ACANTHACEÆ.

Rhinacanthus Communis.—The local name of this shrubby perennial, which is generally cultivated in Bombay gardens as a domestic remedy, is, according to W. Dymock, "Gujkarnee." It is 3–4 feet high; the leaves are 2–3 inches long, ovate oblong; the inflorescence is in axillary and terminal panicles, bitrichotomous and spreading; flowers insignificant, white; tube of corolla long, slender, and compressed. The leaves are a popular remedy for what is called Indian ringworm; they are applied bruised and mixed with lime-juice; when chewed they taste like fresh cassia bark. The roots are small and fibrous, and are said to have aphrodisiacal properties. Ph. J. Trans., Sept. 2d, 1876, p. 190.

Adhatoda Vasica, Local Name in India "Adulsa."—W. Dymock describes the leaves of this shrub, which constitute a drug of the Bombay shops, and have a very considerable reputation as an expectorant amongst native practitioners. The leaves are elliptic oblong, attenuated at both ends, glabrous, upper surface dark green, under surface much lighter, margins waved, petioles half an inch long, length of leaf 4–5 inches, breadth $1\frac{1}{2}$ to $1\frac{3}{4}$ inches, venation reticulated, taste bitter. Ph. J. Trans., Dec. 16th, 1876, p. 492.

VERBENACEÆ.

Vitex Negundo, Local Name in India "Lingoor."—W. Dymock describes this shrub, the habits of which are variable. When growing near the sea it has almost always three-foliolate leaves, the leaflets being attenuated into the petioles. Inland, the shrub has a more delicate appearance; the petioles of the leaves are much longer; the leaflets are lanceolate, from three to five in number,

and often serrated; the flowers do not vary. The serrated variety is preferred for medicinal purposes, and is called "Katree." The leaves of both varieties appear to be equally aromatic; the odor reminds one of the English bog myrtle; the taste is bitter and nauseous. The fruit is like a peppercorn, and very feebly aromatic. The author is of the opinion that the *V. negundo* and *V. trifolia* of the Pharmacopœia of India will prove to be but varieties of the same shrub. In Anthony Colin's French translation of Clusius, Lyons, 1602, there are figures of both plants, which, though old and quaint, represent the general appearance very fairly. Ph. J. Trans., March 10th, 1877, p. 729.

Clerodendron Serratum.—According to W. Dymock the root of the plant, locally called "Bharangi Mul," constitutes a drug of the Bombay shops. It occurs cut into pieces about three inches long, often crooked and twisted, and varying in thickness, the largest being seldom as much as an inch in diameter; the woody portion shows well-marked concentric rings and conspicuous medullary rays; it is very white and tough. The bark has a light-brown epidermis; both wood and bark abound in starch. Bharangi is feebly bitter, and is said to be tonic and antiperiodic. It grows in the Concan. Ph. J. Trans., Jan. 1877, p. 549.

LABIATÆ.

Teucrium Scordium, Lin.—This obsolete remedial agent, which was officinal in most European Pharmacopœias some forty years ago, has, according to J. M. Maisch, been lately again prescribed in this country, in the form of a fluid extract. The author describes the plant, commonly called water germander, and draws attention to the distinction of the various species of the genus Teucrium. With the exception of *T. marum*, Lin., the various species seem to have allied medicinal properties, which are carminative, stimulating, and tonic. *T. marum*, Lin., which is found in the countries bordering on the Mediterranean, and is known as cat thyme, seems to have antispasmodic and errhine properties, and constituted an active ingredient in the *Pulvis sternutatorius* of some old European Pharmacopœias, the composition of this being as follows: Sweet marjoram 3, cat thyme, lily of the valley, orris root, each 1. A *fluid extract of T. scordium* is best made by the officinal process for fluid extract of chimaphila. A. J. Ph., Sept. 1876, p. 393.

Coleus Aromaticus.—According to W. Dymock, the leaves of the plant, which is locally known in Bombay by the name of "Owa," are used with success in colic and dyspepsia, being mixed with articles of food by the natives, and with drinks by Europeans. In Bombay the plant is found in almost every garden. The leaves, which are broad, ovate, crenated, and very thick, are about three inches long, and thickly studded with hairs; those on the upper surface are principally jointed and tapering, with a few simple ones surmounted by a globular, transparent, brilliant gland like a minute dewdrop. On the under surface the glandular hairs are much more numerous and give rise to a frosted appearance. The epidermis is provided with numerous simple stomata. The venation is reticulate and remarkably prominent on the under surface of the leaf. A few oil-globules are met with in the parenchyma, but the aroma is chiefly situated in the glandular hairs. The taste of the leaf is at first pleasantly aromatic, afterwards very pungent; the odor is agreeable and refreshing. Intoxicating effects appear to be attributed to the drug; the author has never heard of its producing such effects, and is of the opinion that, if it ever does, it must be when taken in much larger quantity than is usual. Ph. J. Trans., Oct. 28th, 1876, p. 350.

Pogostemon Purpuricaulis.—According to W. Dymock, the leaves of this plant, locally known as "Phaugla," are medicinally applied in India, in the form of cataplasms, in order to clean wounds and stimulate healthy granulation. It is a tall suffruticose perennial plant, about six feet high, with a purplish smooth stem; leaves often six inches long, broadly ovate, acuminate, serrated, smooth; flowers very small, pale purple, in axillary and terminal panicles; seeds very small, black, and shining. The whole plant has a strong black-currant odor; the fresh leaves have a slightly pungent taste; the plant is common in Kokun. Ph. J. Trans., September 2d, 1876, p. 190.

BORAGINEÆ.

Heliotropium Europæum. Presence of an Alkaloid.—Battandier has obtained an alkaloid—*heliotropia*—from this plant, as follows: 10 kilos of the plant were boiled with acidulated water, the decoction evaporated to syrup, precipitated by strong alcohol, filtered, the filtrate evaporated, the residue treated with potassa and ether, the green ethereal solution with water acidulated with sulphuric acid, and this aqueous liquid again with potassa and ether. The

now colorless ethereal solution yielded upon evaporation a thick oily mass, which gradually concreted into a butyraceous mass, composed of microscopic crystalline lamellæ, and afterwards formed prisms weighing about 2.5 grams.

Heliotropia is soluble in water and diluted acids, forming salts with the latter, which burn with a hornlike odor, leaving a voluminous charcoal. It has a bitter taste like quinia, is white, easily turns yellow, fuses, and partially volatilizes when heated. It is precipitated by tannin, iodohydrargyrate of potassium, potassio-iodide of bismuth, biniodide of potassium, and picric acid. Alkalies separate it in oily drops; bromine converts it into a resin-like mass; Frœhde's reagent produces a brown, and bichromate of potassium with sulphuric acid a green color. It is not affected by acids or by platinic or mercuric chloride. The sulphate and chloride could not be obtained crystallized. It is poisonous, but requires larger doses than either strychnia or morphia.

Heliotropium Peruvianum was also examined, and appears to contain a larger proportion of alkaloid. *H. supinum* and *H. curassavicum* have not yet been examimed. A. J. Ph., April, 1877, p. 177; Rép. de Pharm., 1876, p. 673 to 739.

CONVOLVULACEÆ.

Bazar Scammony (*Suckmuniya*).—According to W. Dymock, that sold in Bombay is all fictitious. It is said to be made in Surat. It does not in the least resemble any kind of genuine scammony. It occurs in irregular fragments of a bright-green color, somewhat translucent at the edges, and having a resinous fracture. Its odor and taste are suggestive of common rosin. Rectified spirit dissolves the resin and leaves a residue of green coloring-matter and gum. The former is evidently of vegetable origin. It is difficult to ascertain what is the purgative principle in the mixture; possibly some resin derived from one of the convolvulaceæ. Sometimes a black suckmuniya is met with; this is also spurious, and is resinous in taste and smell, but has a more earthy appearance than the green variety. Rectified spirit dissolves out a quantity of resin and leaves a black residue, which, under the microscope, is seen to be made up of tufts of vegetable hairs (mucuna?), numerous small carbonaceous particles, and small irregular crystalline particles. Treated with dilute hydrochloric acid it effervesces feebly after a short time. With strong acid it effervesces strongly at once, and the

vegetable matter is destroyed and forms a green solution. In Persia, genuine scammony is to be found, but the author has never been able to ascertain whether it is produced in that country or imported. Ph. J. Trans., Dec. 2d, 1876, p. 450.

Ipomœa Pes-capræ.—According to W. Dymock, the whole plant, locally named Murja Devi, is mucilaginous, and is used in India externally in rheumatism in the form of decoction, and internally in colic. It is a perennial plant with a tough woody root as thick as a finger and many feet in length. It abounds in the sand on the seashore. From the enlarged crown of the root grow a number of creeping stems, fleshy and purplish when young, but becoming woody as they mature. The shape of the leaf is indicated by the name of the plant. A section of the root shows in the central portion five wedge-shaped bundles of laticiferous vessels full of a viscid yellow latex, then again comes a number of irregularly placed fibro-vascular bundles, and external to them another zone of laticiferous vessels. The cellular structure of the root contains starch and large conglomerate raphides. Ph. J. Trans., August 5th, 1876, p. 110.

Argyreia Speciosa.—The local name in Bombay of this convolvulus is, according to W. Dymock, "Samudra Shok." It has handsome heart-shaped leaves, 9–12 inches long and 8–10 broad, or even larger; upper surface dark-green and smooth, under surface white and silky from presence of a felted layer of long simple hairs. Under the microscope these are seen to be simple tubes gradually tapering to a point, and much like the fibre of flax. They are very strong, and not easily removed by pulling or by scraping. They retain moisture well. Samudra leaf is a kind of natural impermeable piline, and is used in much the same way as that substance. With regard to the alleged blistering properties of the upper surface there must be some mistake, as the author has found it to have no effect when applied to the skin, nor has the leaf any acridity when chewed. Ph. J. Trans., Dec. 16th, 1876, p. 491.

Cassytha Filiformis.—The local Indian name for this plant is Akaswail. It is a common parasite on bushes and, according to W. Dymock, is used in the native practice of India as an alterative in bilious affections. Akaswail consists of a tangled mass of tough dark-green stems, branched, marked longitudinally with delicate pale-green lines; the largest are the size of a crowquill. The branches are provided with small round suckers like those of the common dodder. Sections of the stems show a strong fibro-vascular layer

and loose central pith. The fruit is globular, of the size of a pea, and surmounted by the remains of the sepals; on removing the outer envelope of the fruit, which is leathery, an inner envelope is exposed, which consists of two layers, the outer cartilaginous, the inner fleshy and lined with white hairs, each containing a delicate spiral filament. Within this central cavity is a third delicate membranous envelope covered with hair of a similar description and containing the seeds, and this is not in contact with the second envelope, except at the base and apex. Ph. J. Trans., August 5th, 1876, p. 110.

BIGNONIACEÆ.

Pedalium Murex.—W. Dymock describes this plant, the local name of which, in Bombay, is "Karonta," and Burra-Gokhroo. It is a spreading low succulent plant, with oval-dentate obtusely pointed leaves; pedicle axillary, one flowered, shorter than the petiole; one, two, or more dark-brown glandular bodies situated near the axils; flowers yellow; tube of corolla about one inch long; fruit pendulous, about half an inch long, and quarter of an inch in diameter at the base, four-angled, with a straight spine at the base of each angular ridge; above the spines is a narrow portion, which is inserted into the five-clawed calyx; when dry the fruit is corky; it is divided into two cells; the seeds are elongated, narrow, and few in number. The young branches, pedicles, under surface of the leaves and immature capsules have a frosted appearance, which is due to the presence of numerous small, sessile, brilliant, crystalline, four to five-partite glands. The substance of the fruit consists in great part of dense fibro-vascular tissue, forming a kind of four-winged nut; the corky part consists of delicate cellular tissue; when fresh it is green and succulent. The fresh plant has a peculiar disagreeable musky odor. Simple agitation of the young branches in water, without any crushing, produces a viscid mucilage, like white of egg. This the author finds is due to the glandular crystalline bodies above described. The mucilage has a faint peculiar taste, but is not disagreeable. Ph. J. Trans., March 10th, 1877, p. 729.

Calosanthes Indica.—According to W. Dymock the bark of this plant, locally known as "Tetoo" or "Phulphura," is a favorite East Indian remedy in dysentery; it is faintly bitter and a little acrid to the taste, with no particular odor. It is light brown, marked with long rough scars of the fallen petioles, and also thickly

studded with wartlike protuberances about the size of a pin's head; internal surface yellow. The minute structure of the bark does not call for remark, but upon placing a section under the microscope in a little water, the whole field is seen to be filled with delicate needle-shaped crystals, which have escaped from the cut cells of the parenchyma; in entire cells the crystals can be seen *in situ*. The small tree is remarkable for its terminal spikes of fleshy, lurid flowers, which appear at the commencement of the rainy season. Ph. J. Trans., Aug. 26th, 1877, p. 171.

GENTIANACEÆ.

Gentian Root.—Referring to Prof. Maisch's experiments proving the absence of tannic acid in gentian root, which were occasioned by the observation of Patch that gentian root did contain tannic acid, Dr. Hager maintains that the roots of some varieties of "Gentiana" do contain tannic acid, and quotes from his work, "Hager's Pharm. Praxis" (vol. ii, p. 23), in support of his view. Ph. Centr. H., July 13th, 1876, p. 243.

In reply to Dr. Hager's criticism, Prof. Maisch contends that the black color observed in pills made with *some* extracts of gentian and salts of iron, cannot be accepted as proof that the variety of gentian root from which the extract is made contained tannic acid, as the presence of the latter may be accounted for by some foreign astringent root which had been carelessly overlooked. The root of *Gentiana crinita*, Froel., collected near Philadelphia, and that of *G. Catesbæi*, Walt., received from North Carolina, were found to be free from tannic acid. A. J. Ph., Nov. 1876, p. 486.

Quinine Flower, so-called.—Dr. J. Dabney Palmer draws attention to a plant, locally known under the name of *quinine flower*, which, in Florida, appears to enjoy a high reputation as an antiperiodic. It is also a curious fact that persons brought under its influence experience similar sensations, such as tension or fulness in the head, ringing in the ears, or partial deafness, as when under the influence of quinine. The whole plant is used, is permanently bitter, and yields its virtues to water and alcohol. The plant is abundant in the lower portion of Jefferson County, Florida, making its appearance in March or April, and flowering from July to September. Specimens of the plant were sent to Prof. Maisch, whose examination determines it to belong to the gentian family, suborder Gentianeæ, and to correspond with a specimen of

Sabbatia Eliottii, *Stend.*, in the Herbarium of Dan. B. Smith, in the *Philadelphia College of Pharmacy*.—This plant is described in "Chapman's Flora of the Southern United States." In both the herbarium specimen and the plants sent by Dr. Palmer, the calyx lobes are more prominent than might be supposed from the description given in Chapman's work, but they are evidently described as *short* in comparison with the much larger calyx lobes of Sabbatia stellaris, gracilis, and allied species, in which they are about equal to the corolla, while in the species under consideration they are about one-third the length. The herb has at first an herbaceous taste, which gradually develops into a pure and persistent bitter, free from astringency. A. J. Ph., Oct. 1876, pp. 454, 456.

Potalia Amara, *Autlet.*—E. Heckel and A. Haller communicate some preliminary researches on the leaves and stem-bark of the plant, from which it appears that they have obtained from the leaves an impure principle which possesses the emetic properties of the plant in a high degree, while a principle separated from the stem-bark did not appear to have emetic properties. The plant is among the most interesting found in French Guiana, where it grows abundantly. Aublet says of the plant that it is found only in the larger forests. All parts are bitter. The young stems are sometimes charged with granules of a transparent yellow resin, which catches fire on being exposed to flame, and gives off an odor resembling that of benzoin. The leaves and stalks are employed, in form of tea, as a remedy in venereal diseases. The drink in a large dose is emetic, and is said to be used successfully to empty the stomach in cases of suspected poisoning. The authors, however, did not find that all parts of the plant were bitter, having chewed both old and young leaves without perceiving any sensation of bitterness, however prolonged the mastication. On the contrary, the leaves possessed a very aromatic odor and taste, which were intensified in the stem-bark and slightly attenuated in the root-bark. Ph. J. Trans., Jan. 20th, 1877, p. 592; J. de Ph. et de Chim. (4), xxiv, 247.

APOCYNACEÆ.

Thevetia Yccotli, *De C.* (*Joyote*).—Prof. Alfonso Herrera draws attention to this Mexican tree, which is remarkable for its thick foliage, elegance and beauty of its golden-colored flowers, and the uncommon form of its fruit. The Aztecs called it *Joyotli*, hawks-bell, on account of the use they made of the nuts as bells, but

others say that it takes its name from the property of the seeds to cure the bite of the Crotalus, rattlesnake; and the wise physician, Felipe II, says: "The ancient Mexicans made use of the milky juice that the tree produces in abundance, for curing deafness and cutaneous diseases. They applied the leaves topically in toothache, and as an emollient and resolvent to tumors, and lastly, they used the fruit to heal ulcers." At present the fruit is called *huesos ò codos de fraile*, bones or friar's elbow, perhaps from its resemblance to the human elbow. The seeds have a great reputation among the people in hæmorrhoids, being applied triturated and mixed with suet and applied topically. After describing the botanical character of the plant, which is found in the damp, hot regions of the fertile mountains of the great Mexican Cordillera, the author gives the result of a chemical examination of the seeds, to which his attention was attracted on account of their excessive acrimony. By expression in a common press, the seeds of the joyote yielded 40 per cent. of *fixed oil*, resembling almond oil, which, at 20° C. (= 68° F.), has a sp. gr. of 0.9100; at 10° C. (= 50 F.) it becomes turbid, and at 0° C. (= 32° F.) it has the consistence of lard; conc. sulphuric acid imparts a yellow color, changing to rose, and, finally, to deep orange-red; it is a non-drying oil, and appears to be composed of olein and palmitin. By percolating the expressed seeds with ether and evaporating the liquid he obtained a residue of about the same quantity as the expressed oil. The substance exhausted with ether was then treated with water, to remove albuminous and extractive matters, and was finally extracted with 85 per cent. alcohol. The filtered tincture yielded upon spontaneous evaporation a well-defined crystalline glucoside, which the author named

Thevetosin.—This forms odorless, colorless, four-sided prisms, which are excessively acrid, insoluble in water, very little soluble in ether, bisulphide of carbon, fixed and volatile oils, but easily soluble in alcohol, and not volatile. When treated with dilute sulphuric acid the new glucoside is split into glucose and a resinoid body. Its solution is not affected by nitrate of silver, the chlorides of platinum, gold, or iron, iodide or iodate of potassium, tannin, potassa, ammonia, the alkaline carbonates, or by ferro- and ferricyanide of potassium. Physiological experiments made with thevetosin, by Luis Hidalgo Carpia, prove it to be very venomous, acting powerfully emetic and paralyzing the respiratory organs,

and, possibly, the general muscular system. A. J. Ph., April, 1877, pp. 145 to 150.

Strophantus Hispidus, *D. C.*—E. Hardy and N. Gallois announce the isolation of two crystalline principles from the seeds of this apocynaceous plant, called "Inée," and used in tropical Africa as an arrow poison. The seeds deprived of their hairs were powdered and macerated in alcohol, slightly acidulated with hydrochloric acid, the alcoholic tincture filtered, evaporated to the consistence of extract, and treated with cold distilled water. The solution, left to evaporate spontaneously, yielded shining white crystals, which were purified by a second crystallization. The crystals were soluble in cold water, more soluble in hot water, and only slightly or not soluble in alcohol and chloroform. The new body contains no nitrogen, and responded to none of the reactions for alkaloids; it is also not a glucoside. It possesses considerable toxic power, quickly causing cessation of the heart's action when injected into a frog. Pending further chemical studies of this body, the authors adopt for it the name "strophantin."

The tufts of hairs removed from the seeds were subjected to similar treatment, and also yielded a crystalline substance; this presented the reactions of an alkaloid, but did not possess the same physiological properties of "strophantin," as a considerable quantity injected into the foot of a frog did not stop the movements of the heart. The authors have named this substance "inein." Ph. J. Trans., March 17th, 1877, p. 756; Compt. Rend., lxxxiv, 261.

Strychnos Nux Vomica.—According to W. Dymock the local Indian name for the plant is *Kajra*. The wood, called *Goaguree* or *Kajra che lacor*, is met with in the Bombay shops in sticks about fourteen inches long, and from one to one and a half inches in diameter, with the bark on. It is quite a domestic medicine with the Bunnias. When a tonic is required a small portion is brayed upon a stone and administered. Its efficiency is supposed to be much increased by the addition of a piece of the kernel of the coco-demer (Lodoicea). There is no doubt that the preparations of nux vomica are particularly valuable in the atonic complaints so common to hot climates. Ph. J. Trans., Aug. 5th, 1876, p. 109.

Wrightia Tinctoria, *Local Name in India* "*Kala-Koora.*"—The root, in pieces of from three to four inches long, and from one inch to half an inch in diameter, constitutes, according to W. Dymock,

a drug of the Bombay shops. The bark of the root is dark-brown externally, and is studded with numerous little warty projections; the wood is white. Sections of the bark show that the parenchyma contains many cells with red coloring-matter, as well as much starch; towards the inner part of the bark there are numerous large liber cells arranged in two continuous rings. Kala-Kora, when chewed, is moderately bitter; it reddens the saliva. The bark of the stem of *Wrightia tinctoria* is also met with in the shops. It is smoother than the root-bark, and of a paler color, but contains much coloring-matter. Ph. J. Trans., Jan. 6th, 1877, p. 549.

Dæmia Extensa.—According to W. Dymock, the leaves of this climbing plant, locally called "Ooternee," enjoy a general reputation in Western India as an expectorant and emetic, and in Goa, and probably elsewhere, the juice of the fresh leaves is applied to rheumatic swellings. They are roundish cordate, acuminated, acute, auricled at the base, downy, glaucous beneath. They vary in size, but are generally from one to two inches in diameter. The peduncles are long, slender, and heavy; odor mousy and peculiar; taste, faintly bitter and somewhat nauseous. Examined under a lens the upper and under sides of the dry leaf present a green, mossy surface, thickly studded with short white hairs. Ainslie mentions the use of the drug as an anthelmintic. Ph. J. Trans., June 2d, 1877, p. 977.

Gymnea Sylvestre.—The local name of this shrubby, climbing plant in Bombay is, according to W. Dymock, "Kavlee." The upper surface of its leaves is dark green and shining, the lower pale green; their shape varies from ovate-lanceolate to obovate; the venation is transverse and reticulate, with a marginal vein; length four to five inches; taste saltish and acrid. The root is about the size of a little finger or less, not unlike hemidesmus; it has a tough central wood, and when fresh a soft spongy bark, which is reddish-brown and fissured longitudinally; it loses much bulk in drying and becomes loose and transversely fissured; the taste is acrid and saltish; the whole plant abounds in milky juice. Under the microscope the central woody portion of the root is seen to have a radiated structure and to be traversed by large vessels; the extension of the medullary rays into the bark is distinct; the latter is made up of a thin-walled parenchyma, the cells of which contain much starch and tolerably numerous crystalline concretions. There are many lactiferous vessels, especially towards the

inner part. The epidermis consists of several layers of flattened cells of a reddish-brown color. The author is unable to confirm Mr. Edgeworth's statement, that chewing the plant destroys the power of the tongue to appreciate the taste of sugar. Sugar taken into the mouth after chewing the fresh plant, more especially the root-bark, has a saltish taste. Ph. J. Trans., October 14th, 1876, p. 309.

SAPOTEÆ.

Caoutchouc, Solubility in Benzole.—Heeren has observed that the solubility of caoutchouc varies considerably with the source, the reason for which must, however, not be sought so much in any original difference in the natural caoutchouc as in the method of its preparation for commerce. In its natural state it is compact, contains more or less moisture, and is but sparingly dissolved, forming, with benzole, a gelatinous mass. According to the degree of manipulation to which it is subjected in the course of preparation for commerce, however, the water is removed by drying, etc., the consistence of the mass becomes more porous, and it loses a portion of its toughness. Such caoutchouc is much more soluble in benzole, and has less tendency to swell and form a gelatinous solution. The following shows the relative solubility of various commercial caoutchoucs, all of which had been subjected to the action of rollers, as found by the author:

100 parts of solution of caoutchouc contained

Guayaquil,	20	parts.
Carthagena,	16.1	"
Africa,	12.7	"
Mozambique,	11.5	"
Quisembo,	9.0	"
Africa (Niggers),	7.8	"
Para,	17	"
Borneo,	13.8	"
Ceara,	12	"
Rangoon,	9.1	"
Africa (Knökles),	8.6	"
Madagascar,	5.7	"

These percentages were obtained by pouring benzole upon the respective caoutchoucs contained in small flasks, agitating frequently, with occasional addition of benzole until the solutions were as near as possible of the same consistence. A weighed quantity

of each was then suspended in a watch-glass, and the weight of residue ascertained. The above results are, therefore, only relatively correct, but sufficiently so for practical purposes. Zeitschr. Œst. Apoth. Ver., No. 12, 1877, p. 195.

MYRSINEÆ.

Embelia Ribes.—The fruit of this plant, which is common in the neighborhood of Bombay, enjoys, according to W. Dymock, high repute in India as an anthelmintic, especially in tapeworm, and is known under the name of Waiwarung. It is a globular red fruit, rather smaller than a peppercorn, and grows in large bunches. The drug has the five-partite calyx and stalk often attached; the outer shell is striated from the base to the apex, where there is a small beak; its color is reddish-brown, marked with dark spots. Inside the outer shell is the seed, enveloped in a delicate membrane, on removing which a cuplike hollow is seen opposite the insertion of the stalk. The seed is horny, of a reddish-brown color, and its external surface appears to be covered with spots of white mildew, which, however, under the lens, prove to be due to delicate crystalline efflorescence. If kept for any time, the outer shell of the fruit becomes nearly black, hence the statement that two kinds are met with in the shops. From the rapidity with which this change occurs, the author concludes that the quality of the drug is not affected by it. The dose for children is a teaspoonful of the powder twice a day, and a dessertspoonful for adults. It is not purgative; the taste is rather pleasant, slightly astringent, and not unlike that of tea leaves. The worm is expelled dead. A purgative should be given to prepare the patient for the drug. Ph. J. Trans., July 1st, 1876, p. 3.

STYRACEÆ.

Alstonia Scholaris.—According to W. Dymock, this tree, known locally under the name of *Satween*, abounds in the hilly districts in the neighborhood of Bombay, at a short distance from the coast. The *Satween che sal* is much esteemed by the natives as a bitter tonic. It is described in "Pharmacographia," and is sufficiently remarkable for its large stony cells and wavy medullary rays. Ph. J. Trans., Aug. 5th, 1876, p. 110.

Simplecos Racemosa, *Local Name in India*, "*Lodhra.*"—According to W. Dymock, the bark of this tree is of a light fawn color

external surface corky and much fissured transversely; internal of a lighter color and fibrous texture. On making a transverse section, a central layer of a red color is seen between the corky and fibrous portions. Microscopic examination shows that the colored layer is chiefly composed of oblong cells, containing coloring-matter; the inner layer of the bark consists almost entirely of woody fibre. Lodhra bark is very soft and friable; it has a faint balsamic flavor, with slight astringency, and is considered by the natives to be heating, and to promote maturation of the humors of the body; it is also used externally, made into a paste with some adhesive substance, much in the same manner in which a pitch plaster is used. It is in general use in native practice, and is kept in all the shops of Bombay. Ph. J. Trans., Jan. 6th, 1877, p. 549.

ERICINEÆ.

Ledum Palustre.—Nicolai Iwanow has subjected this plant to chemical examination, with special consideration to its volatile oil. Operating with plants collected in the neighborhood of St. Petersburg, he found that the root yields a colorless distillate, which is odorless; the stems yield a turbid distillate, which has a faint odor, and from which a portion of oil separates after standing twenty-four hours; the leaves and young twigs, *gathered before flowering*, yield a large quantity of crystalline stearopten, which is permeated with volatile oil, and separates on the surface of the distillate after standing twenty-four hours. The crystalline mass possesses an intolerable stupefying odor. The same parts of the plant, *gathered during the flowering period*, yield a comparatively smaller quantity of stearopten, the mass having the consistence of goosegrease, of a yellowish color and feeble odor. The same parts, *gathered after the flowering period*, yield an oil which contains still less stearopten, is of a yellow color, and has an aromatic, not at all stupefying odor.

The stearopten, when purified by suitable means, consisted of colorless prismatic crystals, which had a feeble odor, were insoluble in water, but readily soluble in alcohol, ether, chloroform, and benzole. Heated upon platinum foil they were completely volatilized and sublimed without decomposition, the sublimate being composed of thin needles. Both the crystals obtained by crystallization, and those obtained by sublimation, melt at 101° C. (= 213.8° F.), and boil at 174° C. (= 345.2° F.). These alcoholic solutions are right-rotating. Ph. Zeitschr. f. Russ., No. 19, 1877, p. 577.

CAMPANULACEÆ.

Lobelia Nicotianæfolia.—According to W. Dymock this gigantic lobelia, locally known as "Bokenul," is common on the Ghauts. The lower stem is woody, an inch and a half or more in diameter, and almost solid; the upper portion is a hollow tube, ending in a crowded head of flower spikes; the latter are about a foot in length, and when the plant is in fruit, are thickly set with globular capsules, about the size of a pea, to which a portion of the dry flower is often adherent; the capsules are two-celled, each cell containing a fleshy placenta. The seeds are numerous and very small ($\frac{1}{50}$th of an inch in length), oval, flattened, and marked with delicate lines. Several small tubercles surround the site of the placental attachment; the color is light brown. The leaves resemble those of tobacco, they are finely serrated, and covered with simple hairs. The whole plant when mature is studded with small spots of resinous exudation, and is hot and acrid when chewed. Six ounces of the dry spikes, from which the seeds had fallen, yielded half an ounce of dark-brown resin when treated with rectified spirit. The acridity is due to the resin it contains. It is stated in the Pharmacopœia of India that the plant is antispasmodic. The native name, bokenul, or tubular poison plant, would lead one to infer that the plant is poisonous, but the author is not aware that this has been proved. Ph. J. Trans., Aug. 26th, 1876, p. 170.

COMPOSITÆ.

Lactuca Sativa, Analysis.—A. H. Church has subjected the leaves to proximate analysis. Well-developed leaves were selected and dried, at first in warm air and finally at 100° C. (= 212° F.). He found 0.71 albuminoids; 1.68 starch, sugar, and gum; 0.52 cellulose and lignose; 0.22 chlorophyll and fat; 0.89 ash (containing a large proportion of nitrates); 95.98 water. The albuminous matter was ascertained by treating a portion of the leaves with a hot solution of carbolic acid, to coagulate the albuminous matters and to remove nitrates and ammonium compound, and then determining the nitrogen in the residue. Arch. Ph., Jan. 1877, p. 60, from Jour. of Botany.

French Lactucarium.—The principal, if not the sole, producer of lactucarium in France is Mr. Aubergier, of Clermond-Ferrand, in Auvergne, whose researches on the chemistry and therapeutics

of this drug are well known. His first experiments, which were made previous to 1841, were chiefly directed to the selection of the proper variety of lettuce, so as to obtain the largest possible yield of lactucarium. As a result of his investigations, he began the cultivation of *Lactuca altissima*, Bieb., a native of the Caucasus, which is a gigantic herb (hence called *Laitue gigantesque*), having, when cultivated, a height of 9 feet, and a stem 1½ inches in diameter. The manner of collecting the juice differs from that pursued in Germany or Scotland; instead of cutting off the stem near the top, and removing successive slices every day, transverse incisions are made daily, at the time of flowering, into the stem from above downward, and the juice which flows from them is collected in a glass vessel. By the time this is full the juice has coagulated, and is removed; after which, it is shaped into circular cakes of 1½ inch in diameter, which are dried by exposure to the air upon sieves. While it was found, in the commencement of the enterprise, that one person could collect at most 60 grams of the juice per day, Mr. Aubergier has succeeded in training his employés—and he employs only women for this purpose—so well, that the mean daily quantity collected by one person now amounts to about 600 grams (about 1 lb. 5 ozs.), while some very active workers occasionally gather as much as 1 kilogram. New Rem., June, 1877, p. 171, from La Resche Pharm., 1877, 21.

Eupatorium Ayapana.—W. Dymock states that this small shrubby plant, locally called "Ayapana," is cultivated in some of the Bombay gardens, and that it has a reputation chiefly as a stimulant, expectorant, and bitter tonic. It is five to six feet high, branches straight, reddish, with a few simple scattered hairs; young shoots have a somewhat mealy appearance, due to the presence of small particles of a white balsamic exudation; leaves opposite in pairs, their bases uniting around the stem, about four inches long, and three-quarters of an inch broad, fleshy, smooth, lanceolate, attenuated at the base; midrib thick and reddish; flowers bluish. The odor of the plant is aromatic, somewhat like ivy, but more agreeable; the taste also reminds of that plant. Ph. J. Trans., Jan. 6th, 1877, p. 549.

Chrysanthemum Segetum.—According to Landerer, this plant, which is principally found in burying-grounds, is used in Greece in the same manner as the Persian insect powder, and is quite efficacious for the purpose, particularly when used in fumigation. The

plant was known in olden time under the names of *krysanthemon*, or gold flower, *chalkanthemon*, or copper flower, and *heliochrysos*, or sun-gold—the names having reference to the color of the flower-heads. At present it has various popular names, which are equivalent of the English oxeye daisy. A. J. Ph., April, 1877, p. 156.

Pyrethrum Carneum, *Existence of an Alkaloid as Active Constituent.*—Joussel de Bellesme has isolated from pyrethrum powder, by suitable means, a crystallizable principle possessing in a high degree the toxic properties of the plant. This he considers to be an alkaloid, the composition and chemical properties of which remain yet to be investigated. He furthermore believes that the insecticidal properties of pyrethrum powder are wrongly attributed to the volatile oil, or, as some assume, to mechanical action by obstructing their spiracles, and is confident that the principle discovered by him is the active agent. Ph. J. Trans., Aug. 26th, 1876, p. 172; J. de Ph. et de Chim., Aug. 1876.

Persian Insect Powder.—R. Rother has determined the absence of alkaloidal constituents in the flowers of pyrethrum (spec.?), and the presence of several acid bodies, two of which appear to be inert, while the third, *persicin*, is a glucoside, and the active principle. It is very readily split into glucose and a secondary inert body, *persiretin*, which is identical with one of the inert acid bodies before mentioned. Some of the characters of the glucoside are given, but the whole subject appears to require further investigation before a definite place can be accorded to the principles described. Drug. Circ., July, 1876, p. 118.

Further experiments made since prove to the author's satisfaction that *persicin* is not a glucoside, and that the glucose reaction is due to glucose or gum pre-existing in the powder. Ibid., Dec. 1876, p. 198.

Flores Calendulæ, *Analysis of Ash.*—Th. Semenoff finds that clean marigold flowers (air-dry?) lose 11.3 per cent. upon drying at 110° C. (= 230° F.), and yield 8 per cent. of ash, composed as follows: 24.40 potassa, 3.80 soda, 14.40 chloride of sodium, 4.70 lime, 5.00 magnesia, 1.10 alumina, 1.00 oxide of iron, 0.90 sulphuric acid, 8.70 phosphoric acid, 22.10 silica, 13.45 carbonic acid; total, 99.55. Zeitschr. Œst. Ap. Ver., Aug. 20th, 1876, p. 382.

Eclipta Prostrata.—The local name of the plant in India, according to W. Dymock, is "Maka," and the whole plant is used medicinally. It is a prostrate, or ascending plant; stem reddish; leaves

lanceolate, attenuated at the base, with waved edges, one to one and a half inch long. The whole plant is rough to the touch, from the presence of numerous adpressed white hairs. The flower-heads are in pairs, one having a peduncle twice as long as the other; flowers numerous, corolla white; root much branched; woody, fibrous rootlets, almost four inches in length. The structure of the hairs is peculiar; the base is red and turned upwards, upon it is attached a conical white glandular structure. The seeds are wedge-shaped, about the size of lettuce seed, and marked with rough irregular prominences on both sides. The maka is a common weed; it has a strong disagreeable smell when bruised. In Bombay it is used by the natives as a tonic in combination with aromatics, and the bruised leaves are also applied to wounds or sores. It is favorably mentioned in the Pharmacopœia of India as a substitute for taraxacum. Ph. J. Trans., Dec. 16th, 1876, p. 492.

Microrhynchus Sarmentosus.—This plant, the local name of which in Bombay is "Almiræ," is, according to W. Dymock, much used in Goa as a substitute for taraxacum, and is described by him as follows: Stem filiform, procumbent, bearing roots and leaves here and there; leaves crowded, sinuate-pinnatifid, lobes obtuse or subacute; peduncles rather shorter than the leaf, having at the top scaly bracts, which are scarious on the margin. It has fleshy roots about the size of a crowquill, and six to eight inches long; when fresh they are yellowish-white. A section shows a central fibro-vascular column, containing very large fenestrated vessels arranged in a radiating manner. Beyond the radii the parenchyma is loaded with large colorless bodies of irregular size and shape, which gradually diminish in number towards the cortex, where the parenchyma is not occupied by them. The cellular structure is delicate, and the cells large. These bodies appear to be cells distended by some solid, nearly transparent matter, as they always correspond in form and position with neighboring empty cells. Ph. J. Trans., March 10th, 1877, p. 730.

Xanthium Spinosum.—Yvon has reported to the Pharmaceutical Society of Paris (October 4th, 1876) his researches on Xanthium spinosum, and stated that experiments made with the view to determining its alleged prophylactic action in hydrophobia, had given decidedly negative results. A. J. Ph., Dec. 1876, p. 571.

Attention having been prominently drawn to the plant, Prof.

Maisch contributes some interesting notes on the subject (Ibid., April, 1877, p. 158), accompanied by the illustration, represented by Fig. 26. The species of Xanthium under consideration is orig-

Fig. 26.

inally indigenous to the southern part of Europe, from Southern Russia west to France, but has gradually spread farther north into Hungary, Bohemia, Silesia, Switzerland, and Alsace, but in most places occurs but sparingly, the farmers aiming at its extirpation on account of its rapidly spreading into the fields to the great injury of the crops. It has likewise been to some extent intro-

duced into most civilized countries, and in the United States is found spontaneous and completely naturalized in the eastern section, from the New England States south to Georgia, growing in neglected fields, near the seaboard and along rivers. It produces a terete striate and pubescent stem, from one to three feet in height, and has lanceolate or ovate-lanceolate, shortly petiolate leaves, which are white downy beneath, the lower being three-lobed, the upper more or less cut-toothed or entire. At the base of each leaf are stipules, consisting of sharp, three-forked, yellowish spines, frequently attaining an inch in length; the fertile burs are crowned with one short and inconspicuous beak. The leaves dried and powdered are of a green color, have a strong somewhat narcotic odor and a bitter taste, and contain, according to C. C. Keller, volatile oil and bitter extractive. The first notice of its—reputed —value in hydrophobia, seems, according to L. Ladé, to have been made as early as 1861, by Oesterle, in his "Arzneimittellehre," who in turn received his information from Russian sources. No further attention seems to have been given the subject, however, until about a year ago, Dr. Grzymala, of Podolia, recommended it upon a basis of observations extending over twenty years, and numerous cases of men and animals bitten by rabid dogs and wolves. The leaves were recommended to be taken in doses of 0.60 gram, three times daily, uninterruptedly for six weeks, for adults, and half the quantity for children under twelve years, cataplasms of the leaves being applied at the same time.

Several other species of Xanthium are mentioned in Prof. Maisch's paper, but these have no important relation to the present subject.

Xanthium Spinosum.—Guichard states that the drug is met with in the form of stalks bearing leaves and numerous spines. There is room, therefore, for the study of the picked and unpicked drug, and to ascertain which of the two should be employed, as probably the activity of all the parts is not the same. Their yield in extract is very different, 20 grams of the cleaned leaves gave with alcohol 5 grams, or 25 per cent. of green extract containing much chlorophyll. 150 grams of the uncleaned drug treated in the same way yielded also a green extract, but in less quantity, the yield being only 12 grams or $7\frac{1}{2}$ per cent. The difference was due to chlorophyll. 128 grams of the unpicked plant yielded by two successive infusions 50 grams, or 39 per cent of extract. The alcoholic extracts were very bitter; the aqueous extract scarcely so, and the

author therefore considers the alcoholic extract the most active. By appropriate treatment of the two extracts he obtained from the alcoholic extract a crystalline deposit and decided indications that this is an alkaloid; the aqueous extract treated in the same manner gave no results. He hopes soon to be in position to isolate the alkaloid. Ph. J. Trans., Sept. 23d, 1876, p. 249; Rep. de Pharm., iv, p. 513.

Xanthium Spinosum, Analysis of Ash.—R. Godeffroy has subjected the ash of the plant and some of its separate parts to analysis. The entire plant yielded 20–25 per cent. of ash, composed in 100 parts of 9.39 carbonate of calcium, 2.84 sulphate of calcium, 13.18 phosphate of calcium, 8.31 carbonate of magnesium, 1.07 chloride of magnesium, 25.00 carbonate of potassium, 4.39 chloride of potassium, 19.73 silica, 15.81 ferric oxide, and traces of alumina and carbonate of sodium. The leaves and spines yielded from 20.5–21 per cent. of ash, composed in 100 parts as follows: Carbonate of calcium, 6.16; carbonate of magnesium, 13.10; carbonate of potassium, 19.87; phosphate of calcium, 6.50; silica, 48.31; ferric oxide, 5.86. The stems yielded 8.5–9 per cent. of ash, 100 parts of which contained: silica, 52.21; phosphate of calcium, 22.06; carbonate of calcium, 3.46; carbonate of magnesium, 7.79; carbonate of potassium, 0.61; ferric oxide, 14.00. The seeds yielded 2.3–2.4 per cent. of ash, composed in 100 parts of silica, 22.98; phosphate of calcium, 47.22; carbonate of potassium, 18.10; ferric oxide, 9.90. The large percentage of potassa is remarkable. Contrary to a statement made in "Ph. Zeitschr. f. Russland," 1876, p. 403, the ash of the plant contains no nitrate of potassium. The author proposes to determine the quantity of extraction in the various parts of the plant, and to neglect the volatile oil, which he had formerly noticed, and which possesses a chamomile-like odor and nauseous taste, to a more critical examination. Zeitschr. Œst. Ap. Ver., No. 11, 1877, p. 173.

Xanthium Spinosum.—Yvon and Nocard have obtained from 100 parts of the air-dry plant, 11.828 water, 76.518 organic, and 11.654 parts of inorganic matter. Among the organic constituents was found 10.632 starch, 0.808 glucose, 2.040 chlorophyll and resin soluble in ether, the remaining 63.038 parts consisting of cellulose, acids, and probably an alkaloid. The mineral constituents were those usually found in plants, lime (2.454 p.) and magnesia (2.436 p.) preponderating. By following the process of Stas, liquids were

obtained which yielded precipitate with several of the reagents of alkaloids. The authors remark, however, that by treating sandarac, olibanum, and other resins in the same manner, similar reactions may be obtained. A. J. Ph., Dec. 1876, p. 538, from Rép. de Ph., 1876, p. 546.

VALERIANACEÆ.

Valerian Root.—Prof. Bentley draws attention to an admixture of the rhizomes and roots of a species of *Veratrum*, evidently *Veratrum album*, *L.*, with the similar parts of Valeriana officinalis. He is of opinion that this admixture is quite accidental, and accounts for it by the theory that the two rhizomes were gathered together on the continent of Europe, and probably in ignorance of their different natures. The author draws attention to the characters by which the two roots may be distinguished from each other, and which should at once cause a recognition of the admixture. A prominent chemical distinction of the two rhizomes consists in the application of sulphuric acid to a transverse or vertical section, when if the rhizome under examination is that of valerian, it will simply heighten the natural color of the section, while if it is the rhizome of veratrum album the color will be at once changed to a deep orange-yellowish red, which soon changes to a dark blood-red. Ph. J. Trans., Feb. 10th, 1877, p. 649.

RUBIACEÆ.

Ipecacuanha.—T. M. Stewart has determined the emetia in eight samples of powdered ipecacuanha, obtaining by both volumetric and gravimetric determination corresponding results. The percentages were respectively 1.75, 1.45, 2.10, 1.60, 1.90, 2.00, 1.90, and 2.05, being on an average, 1.84 per cent. (See morphiometric assay of opium in this report.) A. J. Ph., August, 1876, p. 359.

Pavetta Indica.—The root of this plant constitutes an East Indian drug, locally known as "Paptee che mul." It is bitter and aperient, but no exact observations of its action appear to have been made. The plant is a very small common shrub, the root is much crooked, from one-quarter to one inch in diameter, and has a gray bark with light-brown epidermis, which seems to be the most active part. A section placed under the microscope showed large laticiferous vessels containing a greenish latex and a cellular structure containing many small starch-granules. Ph. J. Trans., August 26th, 1876.

Morinda Citrifolia and M. Tomentosa.—The leaves of these plants are, according to W. Dymock, used in India as a healing application to wounds and ulcers. They are very bitter, and are said to possess tonic and febrifuge properties. The first plant, locally known as "Aal" or "Bartundie," is distinguished by its large oval, oblong, shining leaves, and the second, locally named "Asa," by the young branches and leaves being tomentose. Both have white flowers with a long infundibuliform corolla, and in both the berries are fused into an oblong fleshy fruit. That of *M. citrifolia* is the largest, being often more than three inches in length. It is pale-green, smooth, and when fully ripe fetid beyond description. In the pulp are imbedded a number of black seeds, somewhat like apple pips. Ph. J. Trans., Oct. 28th, 1876, p. 350.

Gardenia Gummifera and G. Lucida, Local Name in India, "Dikamali."—The gum of these trees, as met with in commerce, is described in the Pharmacopœia of India. According to W. Dymock, however, it has a very different appearance in a pure state, being transparent and of a bright golden-yellow. The odor is powerful, and like valerian, without its camphoraceous aroma. Pure Dikamali dissolves very rapidly in rectified spirit, forming a solution the color of pale sherry, which when poured into water forms a delicate primrose-colored emulsion. This after standing twenty-four hours deposits a portion of resin in an opaque condition, and of the color of precipitated sulphur, but not sufficient to affect the color or opacity of the emulsion. Besides the external uses generally mentioned in books on Indian Materia Medica, Dikamali is in Bombay much prescribed in dyspepsia attended with flatulency, and is favorably spoken of by those who have taken it. Ph. J. Trans., Dec. 16th, 1876, p. 491.

Dikamali Resin.—Prof. Flückiger has recently subjected a small sample of this resin, which he had received from the late Mr. D. Hanbury, to chemical examination. Dr. Stenhouse had pointed out that it contains a crystallizable resin, "gardenin," but had apparently operated with an old sample of dikamali, which did not enable him to examine it so exactly as many interesting chemical products which he has submitted to careful investigation.

The sample of dikamali examined by Prof. Flückiger has a well-marked peculiar strong odor, somewhat recalling that of rue, and at the same time of aloes. It is of a crystalline appearance and yellowish hue, the powdered drug displaying a decidedly fine yellow

color. By gently warming the drug with alcohol (0.830 sp. gr.) a large amount of adherent bark and wood remains undissolved. The solution of the resin is of a fine yellow color, with a marked greenish hue. It does not alter litmus paper, and assumes an intensely greenish-brown color on addition of perchloride of iron; on addition of a little soda it turns brown. If dikamali resin is melted with caustic potash or soda an offensive odor, no doubt due to some volatile fatty acid, is evolved. The melted mass was dissolved in water, neutralized with sulphuric acid, the sulphate of potassium allowed to crystallize, and the mother liquor then shaken with ether, which by evaporation yielded crystals which the author believes to be *protocatechuic acid*. They produced a fine greenish-blue coloration with a dilute solution of perchloride of iron, turning red when bicarbonate of sodium was added. Dikamali resin consequently belongs to the *aromatic* class of organic substances.

By exhausting the resin with hot alcohol, about sp. gr. 0.830, and allowing to cool, a good crop of crystals of *gardenin* was obtained. These were purified from adhering resin by repeated crystallizations from hot alcohol. It finally consisted of yellowish acicular crystals, melting at about 155° C. (311° F.), and when submitted to ultimate analysis, proved to have a composition corresponding to the formula $C_{23}H_{30}O_{10}$ (O = 16). The amorphous portion of the resin was also subjected to examination, and, as obtained by the author, was brownish, soft, and melted at 100° C. (212° F.); subjected to ultimate analysis he obtained figures from which the formula $C_{23}H_{34}O_4$ (O = 16) may be calculated, although it does not answer very satisfactorily. Ph. J. Trans., Jan. 20th, 1877, p. 589.

Randia Dumetorum.—A good description of the fruit, with an interesting account of its properties, will be found in Moodeen Sheriff's Appendix to the Pharmacopœia of India. W. Dymock states that the plant is locally known in Bombay by the name of "Ghelaphul," and gives some additional description of the fruit. The grayish pulp surrounding the seeds is composed of large oval cells containing a little granular matter. The pulp of the pericarp is remarkable for numerous large reddish-brown stony cells. The epidermis is formed of tessellated cells of irregular size and shape. The albumen of the seeds is horny and translucent. This drug is much used in native practice, and is well worthy of attention. Ph. J. Trans., Dec. 16th, 1876, p. 491.

Cinchona Cultivation in British Sikhim.—Mr. Geo. King, superintendent of the Royal Botanical Garden, Calcutta, and of the cinchona cultivation in Bengal, has made a report of the work done on the cinchona plantation during the year 1875–76. The record is more one of harvest than of planting. After thirteen years of expenditure, at first on experiments, and latterly on *bonâ fide* planting, during which period but little return was received, the scale has now begun to turn, and for the first time in its history the plantation has yielded a tangible result in the way of crop, 211,931 pounds of dry bark having been collected since the last annual report. The past year has added considerable to the experience on several matters of importance connected with the cinchona harvest. Experience has been got for the first time of the results of uprooting the trees—a mode of working suggested by Mr. Gammie in imitation of the well-known practice of the *cascarillados* in the natural cinchona forests of South America. The root-bark of this plantation contains, according to Mr. Wood's analysis, about 8 per cent. of total alkaloids, and is therefore richer than the finest stem bark of this plantation, which rarely yields more than 7 per cent. It has, moreover, all along been found that in the operation of coppicing (*i. e.*, cutting the trees and leaving the roots to shoot) a certain proportion of the stools fail to shoot, in other words they die, and as the bark of every part of a dead cinchona tree is perfectly destitute of alkaloid, there is always in coppicing a certain amount of bark lost. It appeared, therefore, well worth while to give a trial to a method which would make sure of the bark of every tree touched. From two experiments, which are recorded in the report, it appears that this is by no means a difficult or expensive process, bark so taken having cost for collection about two and a fourth pics per pound when green, against one and three-fourths pics per pound for green bark taken by coppicing. During the process of uprooting, a very thorough upturning cannot fail to be given to the soil, and it is therefore hoped that it may be found to answer to replant such ground at once with cinchona, and thus to secure gratuitously the advantage of a very complete kind of digging. With this view a certain proportion of the uprooted area will, during the earliest good planting weather that occurs, be replanted with red barks, care being taken to avoid, as far as possible, the exact spots occupied by the uprooted trees. The great objection to immediate replanting with the same species is of course the obvious one that the soil is possibly to some extent ex-

hausted for red bark. But, after all, the only part of the former trees which has been removed is the bark; the leaves, branches, and (as far as the coolies can be prevented from appropriating it as fuel) the wood also, being allowed to decay on the ground. If experience should show that immediate replanting does not answer, a period of rest can be allowed to the soil. As regards the proportion of root- to stem- and branch-bark, an uprooted three-acre patch gives for healthy succirubra trees planted 4 x 4 feet, three and a half years old, and from which no bark had previously been taken, the following percentages of green bark: root, 26.5; stem, 30.2; and branch, 43.3 per cent. But in the process of drying these three sorts of bark lose weight in different proportions. The loss of weight in drying varies, moreover, with the season. The actual figures are thus tabulated:

100	pounds	green	root-bark	dried	to	32.94 pounds.
100	"	"	stem-bark	"		34.06 "
100	"	"	branch-bark	"		27.30 "

Experiments will be continued both with coppicing and uprooting, and experience alone can determine which will pay best. With regard to a third method of harvesting which has been proposed, viz., decortication of living trees, former experience has shown that renewal of bark under moss is a failure in Sikhim, owing to the attack of ants, and no further experiments have therefore been made by that method. The cost of bark, deducting for 16,640 pounds which had been destroyed by fire, is found to be a little over $3\frac{1}{2}$ annas (about $5\frac{1}{2}$ pence sterling per pound). If the charge for interest on capital be added, it is very nearly 4 annas, or $7\frac{1}{8}$ pence sterling per pound. It is estimated by Mr. Wood, the government Quinologist, that the crop of bark for 1876–77 will be about 366,000 pounds, and Mr. King believes that this quantity can advantageously be taken from the plantation during the period mentioned. This is certainly very encouraging, when it is considered that Mr. Hume, in his letters reviewing the plantation report of 1873–74, estimated the yield, by the year 1877, at the rate of 150,000 pounds of dry bark per annum. Ph. J. Trans., Dec. 23d and 30th, 1876, pp. 512 and 534.

Cinchona Culture in Java.—The cinchona bark harvest in Java was completed at the end of September, and yielded fully 45,000 kilos, of which 11,534 kilos were ready for shipment to Europe. At the auction sale in Amsterdam of the cinchona bark harvest of 1875,

which took place June 1st, 1876, the amount realized was 11,314.16 florins, while the total expenses of the culture during that year were 49,857.46 florins. Dr. C. Hasskarl, in his quarterly report, states that the decree of the Dutch government to send him to South America for the purpose of transplanting the cinchonas to Java, is dated June 30th, 1852, so that the twenty-fifth anniversary of that culture is near at hand. A. J. Ph., April, 1877, p. 172, from Pharm. Handelsbl., Jan. 17th.

Cinchona Calisaya Ledgeriana.—In the report of Van Gorkom to the Dutch government upon the progress of the Dutch cinchona plantations in Java during the second quarter of 1876, mention is made of a number of excellent seed-bearing trees of this variety of cinchona. During the examination of some specimens of bark from these plants, one was met with that yielded 13.25 per cent. of quinia, or equal to 17.86 per cent. of sulphate of quinia. Ph. J. Trans., Oct. 28th, 1876, p. 360.

Cinchona Culture, Experiments by the Japanese.—In the last quarterly report respecting the Dutch government cinchona plantations in Java, it is stated that an attempt is to be made to acclimatize the cinchona in Japan. An application has been received from the Japanese government for a supply of young plants for the purpose, and a selection of specimens of the best varieties of the Dutch plantations has accordingly been forwarded. Ph. J. Trans., July 22d, 1876, p. 80.

Cinchona, Proposed Acclimatization. Experiments with certain of the better kinds in Peru.—M. Martinet, writing from Lima, in Peru, to the Paris Acclimatization Society, calls attention to the advantages that might result from an attempt to acclimatize in the Lima district the better kinds of Bolivian and Carabayan barks, giving to the plants the same care in cultivation as the English give to those in their stations in the Himalaya, Ootacamund, etc. Mr. M. says that the rich cinchona forests in Bolivia and Southern Peru, where the calisaya is found, are becoming further and further removed from the coast. No attempt is ever made to restock the nearer forests in the cinchoniferous zone with these valuable trees, and now the nearest forests are upwards of ten days' march from inhabited districts. The convex portion of the arc described by the cinchoniferous zone is, it is true, scarcely sixty leagues from Lima, and will soon be connected with it by the trans-Andean railway, but in this district only cinchonas poor in alkaloids at present grow. Ph. J. Trans., Dec. 16th, 1876, p. 500.

Cinchona, Qualitative Examination.—Lepage and Patrouillard give the following process: Take a fragment from several barks in the same bundle, and reduce to a fine powder; suspend 1 gram of the powder in 10 grams of distilled water, containing 1 gram of dilute sulphuric acid, and leave them in contact for two or three hours, agitating frequently. At the end of this time add 70 grams of distilled water, and leave in contact for several hours more, still taking care to agitate the mixture frequently. Then allow it to deposit, and afterwards filter. If the cinchona be of good quality, solution of the double iodide of cadmium and potassium, prepared by dissolving 2.80 grams of iodide of cadmium and 2.50 grams of iodide of potassium in 50 grams of distilled water, when poured in slight excess into this liquid, should produce at once an abundant turbidity, resulting, after some hours, in a voluminous precipitate. If the bark contains not more than 10 or 12 parts of alkaloid per 1000, the reagent does not give rise to any turbidity, or at most to a slight opacity. The yellow, red, and gray barks may be examined in this manner. Ph. J. Trans., March 31st, 1877, p. 795.

Hymenodictyon Obovatum and H. Excelsum.—Both of these trees grow in the neighborhood of Bombay, according to W. Dymock, and yield a bitter bark in common use among the natives as a tonic. The first mentioned is locally known under the name of *Suffed Kurwah ; H. excelsum* as *Kara Kurwah.* The bark of the latter is much more bitter and may be distinguished from that of *H. obovatum* by its red color, and is probably the most valuable. The minute structure of these barks resembles that of the cinchonas, but the bundles of liber cells are larger, especially in *H. obovatum ;* the spiral and laticiferous vessels, also, are more numerous, the latter being very large in *H. obovatum* and exuding, when cut, a waxy latex. In *H. excelsum*, many of the cells are filled with a red coloring-matter, as in cinchona bark, and there is a continuous ring of liber cells near the junction of the bark with the wood; the liber cells in both varieties exhibit a large central cavity. The bark examined was from a bunch about one inch in diameter. Ph. J. Trans., Aug. 5th, 1876, p. 110.

UMBELLIFERÆ.

Sium Latifolium, Gray.—The root of this plant, growing in California, and known as "wild parsnip," appears to have poison-

ous properties, a man, after eating some of the roots several years ago, having suffered poisonous effects. Andrew R. Porter has made a chemical examination of the root, and finds it to contain, besides volatile oil, fixed oil, sugar, gum, albumen, and pectin, a *resin*, which the author has not obtained in a completely pure condition, but which appears to be the poisonous principle. As obtained, it is a reddish-brown powder, producing a very slight odor and but little taste, is fusible when heated, uncrystallizable, soluble in alcohol, chloroform, and ether, insoluble in benzin and bisulphide of carbon. Caustic potassa dissolves it only in part, leaving a portion that is not fusible by heat. An alkaloid was searched for but not obtained.

The author describes the root as follows: Sium latifolium has a short, upright root-stock, varying in size from one-half to two inches or more in length, and about the same in diameter, so that it becomes spherical in outline; bases of leaves are still attached to the crown. It presents a very rough, wrinkled appearance, and is of a gray or yellowish-brown color. It branches at once into a number of large roots, from four to twelve, and even more. These are of the same color, from one-eighth to one-half or three-quarters of an inch in thickness, two to six inches long, very much wrinkled longitudinally, somewhat flattened and contorted, and nearly uniform in thickness. On soaking in water they become about twice as large. The dried root breaks with a very short fracture, is white inside, with a yellowish, spongy meditullium and numerous resin-cells, which are plainly visible to the naked eye, scattered irregularly throughout the bark. The root has rather an agreeable odor, and a sweetish, aromatic, and somewhat pungent taste. A. J. Ph., Aug. 1876, p. 348.

Nathan Rogers has subjected the root to chemical examination. By following Wittstein's process for obtaining pastinacia, he obtained a volatile alkaloid, having a resinous odor and a pungent taste, and capable of forming a crystalline sulphate. Besides this, the root contains volatile oil, two acid resins and indifferent resins, sugar, albumen, gum, and starch, the latter polarizing but feebly under the microscope, and appearing oblong in shape, different in size, and quite small. The volatile oil is of a light straw-color, neutral in reaction, and possesses a pungent odor somewhat resembling that of carrots. The volatile alkali, as also its crystallized sulphate, appears to be inert, and it is probably analogous to pastinacia. The poisonous character of the root appears to be due

to one or more of its resinous components, 10 grains of the resinous mass obtained, when administered to dogs, lessening the frequency of the heart's beat, and producing dizziness, vomiting, and purging, with slight convulsive movements. After the disappearance of the poisonous symptoms, the animals were left in a prostrate, weakened condition, from which they slowly recovered. A. J. Ph., Nov. 1876, p. 483.

Fennel.—According to Prof. Landerer the fruit of fennel, called *marathron* in Greece, has been always highly esteemed in Oriental countries as a remedy for sore eyes, and to the present day is applied by the people for that purpose in the form of infusion and cataplasm. A. J. Ph., April, 1877, p. 156.

Caraway, which appears to be the *kyminon* of the old and the *karos* of later writers, has also enjoyed great reputation. Among the preparations formerly employed, was particularly a mixture with salt and a kind of sauce, to prepare which special servants were kept by the rich. At present, caraway is used in Greece like other common aromatic plants. Ibid., 156.

Angelica Root.—Carl Brimmer finds that angelica root is very variable in its composition. 25 kilograms of two-year old root, which had been very thoroughly dried, yielded but 1 gram of pure angelicin and no crystallizable sugar. The one-year old roots yielded a little more angelicin. On the other hand, 15 kilograms of *air-dry* two-year-old root yielded 4 grams of pure angelicin, and an abundance of crystallizable sugar, resin, and wax.

Angelicin, as obtained by the author, formed light, white, pearly, glistening leaflets, which were absolutely odorless and tasteless, insoluble in water, melted at 126.5° C. (= 259.7° F.), and had the empirical composition $C_{18}H_{30}O$. In its composition, as also in its relation to reagents, it corresponds very nearly to the *hydrocarotin* of Husemann. The

Angelica sugar proved to be cane-sugar. The

Angelica resin yielded, when melted with caustic potassa, resorcin, protocatechuic acid, volatile fatty acids, and acetic acid.

The author ascribes the activity of angelica root to *angelic acid*, which was obtained in abundance, and to the volatile oil. Ph. Centralhalle, No. 13, 1877, p. 100.

Ferula Sp.?—According to W. Dymock, the seed, locally known by the name of "Dookoo," is used in India as a carminative and stimulant; it is also said to be diuretic. It is said to be imported

from Persia and Afghanistan. The carpels are broadly elliptical, and vary much in size; the largest are five-eighths of an inch long and three-fifths broad; foliaceous, convex in the middle, with a dilated border, consisting of coarse cellular tissue; color reddish-brown over the seed, margin yellowish; dorsal ridges, seven; the three central filiform; vittæ in dorsal furrows, ten to thirteen; vittæ of commissure, six. The vittæ contain a quantity of yellow oily fluid, having a powerful lemon odor. By distillation a light-yellow essential oil was obtained, with an odor like oil of orange leaf. Ph. J. Trans., Aug. 26th, 1876, p. 170.

Euryangium Sumbul.—Karl Wittmann states that sumbul is found in large quantities in the neighborhood of Chabarowka, a military post on the Amur, in the province of Küsten, East Siberia. It is a perennial umbellifer, grows to the height of from 3 to 5 feet, has a branched fleshy root, about 11 inches in circumference at the base and $3\frac{3}{4}$ inches in diameter, with numerous rootlets, and covered with a brown bark. The strong musky smell of the root is considerably increased by moistening it with water. The stalk of the plant is always fleshy, equal in circumference at the base with the root, becoming gradually more slender towards the top. The leaves are more than twice pinnatifid, the pinnæ lancet-shaped, sharply serrate, the umbels with thirty to fifty rays, the flowers white and small. The Eastern Russian inhabitants call the Euryangium sumbul "Bärenklaue" (bear's claw), and use the root as a medicine. The Chinese living in the district use the root against various diseases, and call it "Lsóuma-tschen-tuck." By the natives, who use it internally as a remedy for swellings, it is called "Ofuokgi" and "Ouchi." The author promises to make an examination of the separate constituents of the root as it is found in the district of Chabarowka. A. J. Ph., Dec. 1876, p. 543; Ph. Zeitschr. Russ., 1876, 545.

RANUNCULACEÆ.

Adonis Vernalis, Lin., Aconitic Acid in the Leaves.—F. Linderos obtained from the dried leaves of this plant, which are medicinally employed in some parts of Europe on account of their drastic properties, nearly 10 per cent. of aconitic acid, which appears to be combined with calcium and magnesium. A. J. Ph., Dec. 1876, p. 540; Ann. Ch., vol. 182, p. 365.

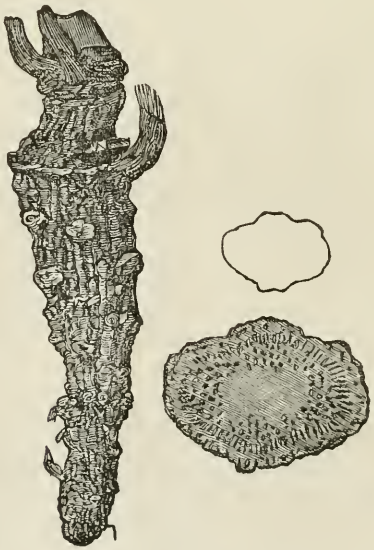
Stavesacre Seeds.—Balmano Squire has found that the activity of the seed as a parasiticide is due to the fixed oil which they con-

tain in abundance. This is both colorless and odorless, and may be readily obtained from the seeds by expression. He recommends its application in form of ointment, such a preparation being more sightly and far superior to that made either by incorporating the powdered seed or infusing the whole seed in fat. The latter, however, appears to be inferior to that made from the expressed oil, only in that it is strongly colored. Ph. J. Trans., June 23d, 1877, p. 1042.

Aconite Root, Adulteration with Masterwort Root.—E. M. Holmes notices a recent adulteration of aconite root with that of masterwort, *Imperatoria ostruthium*, L., doubtless the result of careless collection or accidental admixture, since the adulterant has a much higher commercial value than aconite. The sample contained about 5 per cent. of the masterwort root, and appears to have been imported from Germany. The characters by which masterwort root may be distinguished from aconite root are as follows:

The rootstock (Fig. 27), for it is properly so called, is less taper-

Fig. 27.

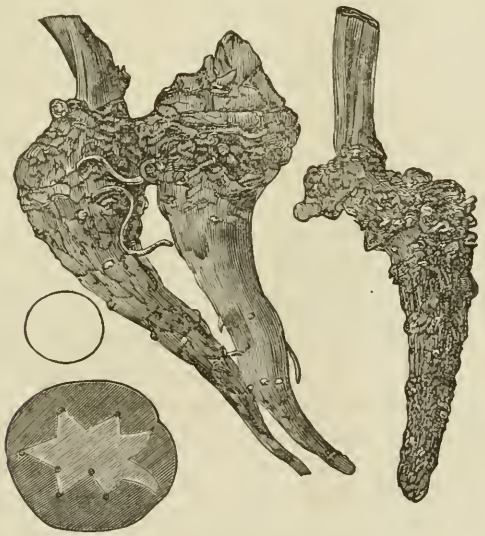


ing than aconite root, is slightly compressed, and exhibits several warty zones, indicating periods of growth. In some specimens these are much less prominent than in others, but can always be

traced. The whole of the rootstock is finely wrinkled transversely so as to give it a somewhat annulated appearance. The transverse section presents very marked characters. The central portion is of a yellowish-white color, and exhibits a more or less complete ring of brownish dots. The portion next the bark presents elongated dots of a paler color, which give this portion of the section a radiate appearance. With the aid of a lens, these dots are seen to be filled with an oily or resinous substance. The cortical portion is very thin. The rootstock has an odor comparable to bruised ivy leaves, or to the plant commonly known as cow parsley (*Chærophyllum sylvestre, L.*), and a pungent slightly bitter taste.

Aconite root is very variable in appearance internally; frequently the centre is quite hollow. Some pieces have a brownish color, others are white and starchy, and a few present a resinous fracture. In a sound root, however, which is usually starchy or slightly resinous, a faint line may generally be traced, which marks out the meditullium. This line has usually five to nine prominent angles (see Fig. 28), the number of angles being larger as the section ap-

Fig. 28.



proaches the top of the root. If the root be wetted and examined with a lens, the line is seen to consist of an irregular line of vessels, which form small bundles in the apex of the projecting angles. The

cortical portion occupies nearly half of the circumference of the root. In the wood-cuts the roots are represented of the natural size; the sections are shown both of the natural size and magnified.

From the above characters it will be observed that the presence of oil-receptacles in the masterwort root at once distinguishes it from aconite. A spirituous tincture of masterwort, when dropped into water, gives a blue fluorescence resembling that of quinine, and a slight milkiness, and communicates to the water its peculiar odor. By these characters its presence might probably be detected in a mixture containing tincture of aconite. Ph. J. Trans., March 17th, 1877, p. 749.

MAGNOLIACEÆ.

Michelia Champaca.—W. Dymock finds that the bark mentioned in the Pharmacopœia of India as a febrifuge is very feebly bitter, and does not, therefore, think it of much use. It is locally known as "Champa." The fresh bark is externally covered with a light-brown epidermis, which is easily removed; beneath this it is reddish-brown, mottled with longitudinal green stripes (not visible in the dry bark), and pale yellowish scars of very irregular form; the inner surface is yellowish and fibrous. Its minute structure is chiefly remarkable for numerous bundles of liber cells and for aggregations of large stony cells of a bright-yellow color. The cells of the parenchyma contain much starch. Ph. J. Trans., August 26th, 1876, p. 171.

RUTACEÆ.

Tagonia Mysorensis.—The whole plant, known in India by the name of Dumaso, is, according to W. Dymock, commonly kept in the shops of Bombay, being used to prepare a cooling wash for the mouth. It is suffrutescent, much branched, with opposite, two-stipuled leaves; the stipules are often thorny, leaflets linear cuspidate; the wood of the stem is white and very hard, covered by a ragged light-brown bark, which becomes slimy and mucilaginous when moistened. Dumaso has no particular taste. Ph. J. Trans., Aug. 5th, 1876, p. 110.

Resina Guaiaci Peruviana Aromatica vel Odorata.—This peculiar resin, which has for a number of years been sold by Gehe & Co., of Dresden, for perfumery purposes, but the origin of which, notwithstanding the earnest endeavors of Prof. Flückiger, has not

yet been determined, has been subjected to chemical examination by Adolf Kopp. The resin is described as homogeneous, yellowish-brown, brittle, and electric masses, melting at 90° C. (= 194° F.), transparent in thin layers, and glistening. Its strong odor reminds of rue, anise, and lemon, but is not due to ethereal oil alone. Its taste is sharp, acrid, and unpleasant. It does not acquire a green or blue coloration, either by long exposure to the air, or by the action of chloride of iron, nitric acid, iodine water, or chlorine water, and, in fact, resembles guaiacum resin only in its color. It is readily and almost completely soluble in alcohol, ether, chloroform, and in bisulphide of carbon, and remains upon the evaporation of its solutions in an amorphous condition. Its alcoholic solution is yellowish-red, reacts slightly acid, is rendered turbid on the addition, but the resin is not completely precipitated unless chloride of sodium is added. The resin is colored red by concentrated sulphuric acid, while warm concentrated nitric acid reacts very violently. By distillation the author obtained 4 per cent. of a yellow, neutral

Volatile oil, possessing an odor reminding of peppermint and lemons, and a sp. gr. of 0.87. It is evidently very complex, being composed of portions which are left rotating and portions which are right rotating, and it is separable into oxygenated oils and into hydrocarbons.

The author, furthermore, describes the products of the reaction of melting potassa, of nitric acid, and of dry distillation. By the latter action, a brown empyreumatic oil is obtained, which by fractional distillation, was separated into five portions, the three first of which were brownish-yellow, the fourth was azure-blue, while the last portion was brown, but upon standing became violet-blue, and by fractioning yielded an additional portion of blue oil. The blue oil resembles the blue oil of galbanum resin very closely. Arch. Ph., Sept. 1876, pp. 193 to 205.

Pilocarpus Pinnatus (*Jaborandi*).—In continuation of his previous paper, Ernest Hardy communicates a comprehensive paper on the jaborandi originally introduced by Dr. Coutinho. After reviewing the history of its introduction, the author draws attention to the variation in the physiological results obtained by various experiments, which he attributes to the circumstances that they have not always experimented with *true jaborandi*, *i. e.*, the leaves of *Pilocarpus pinnatus* (*or pennatus*). The identity of the

latter with the jaborandi of Dr. Coutinho, and the valuable physiological properties claimed for the drug, he considers to be beyond dispute. This jaborandi is the only one to which the author's remarks apply. It grows in the north of Brazil, in the provinces of Céara and Pianhy, the warmest in the empire, in the neighborhood of Pernambuco; it is found especially upon the sides of mountains in the Sierra de Biapata. MM. Baillon and Planchon describe *Pilocarpus pinnatus** as a very beautiful shrub, eight or ten feet high, completely glabrous when full grown. Its cylindrical branches are covered with a pale bark, sprinkled all over with whitish projecting lenticular spots. This bark is easily detached from the ligneous portion; its internal surface is white and finely striated longitudinally. Examined microscopically it presents below the suberous layer a circle of well-characterized glands, analogous to the oil-glands of *Citrus;* in the liber layers are sclerogenous cells, each containing a drop of resinous matter; and further in the interior are resiniferous cells. These same cells are found disseminated in all the layers of the roots, except in the thin epidermic flakes which exfoliate on the surface of that organ. The taste of the root-bark is very strong. The leaves are compound, alternate, without stipules, imparipinnate, with 9 (sometimes 7, rarely 11) leaflets, and sometimes attain a length of 18 inches. The leaflets are in opposite pairs, varying in form with the individual and with the position of the leaf; they are sometimes 6 inches long and 2 inches broad. The midrib is very prominent on the under surface, less so on the upper. Under a microscope numerous oil-glands can be seen on the leaves, the glands being constituted like those of the exterior parts of the bark and stem. The flowers are disposed in a long flexible raceme, sometimes nearly 20 inches long, and bearing upwards of a hundred flowers. Some of the inflorescence is terminal, but the greater part occurs on the stems and branches. The flowers have a short peduncle, a small calyx with five slightly marked teeth; the corolla before opening forms an ovoid, nearly globular, bud; the petals are thick, tawny gray, marked with numerous oil-glands, $\frac{1}{10}$ to $\frac{1}{8}$ inch long. There are five stamens, alternate with the petals. The pistil is short, sur-

* The editor of "Ph. J. Trans." draws attention to the fact that the original name given to it by Lemaire was "*pennatifolius*," as may be seen by referring to Lemaire's paper in the "Jardin Fleuriste," vol. iii, tab. 253, July, 1852. —Rep.

mounted by five stigmata. The shell-like fruit usually contains a single seed.

The leaves and stem of *Pilocarpus pinnatus* have a complex chemical composition. They contain an essential oil, a peculiar alkaloid (pilocarpina), and various salts, which have already been alluded to and described in the author's previous papers. Submitted to distillation with water, the leaves yield an essential oil, which is easily collected. Ten kilograms of the leaves yield 56 grams of the crude oil; this, fractionally distilled, yielded a hydrocarbon boiling at 178° C. (= 352.4° F.), a substance passing over at 250° C. (492° F.), and a third product, which distilled at a still higher temperature, and after a time formed a solid transparent mass.

Pilocarpene, the hydrocarbon boiling at 178° C. (= 352.4° F.), is a colorless, transparent, mobile liquid, having a peculiar and rather agreeable odor, and a sp. gr., at 18° C. (= 64.4° F.), of 0.852. It rotates the plane of polarized light to the right, its rotatory powers for the D ray being a = + 1.21. Its composition corresponds to the formula $C_{10}H_{16}$. It forms with hydrochloric acid a solid and liquid bihydrochlorate, both corresponding to the formula $C_{10}H_{16}2HCl$. The solid hydrochlorate is a crystallizable colorless transparent body, melting at 49.5° C. (= 121.1° F). With a solution of perchloride of iron it gives the successively rose, red, and blue colors characteristic of the bihydrochlorate. The author is certain that there is no monohydrochlorate or artificial camphor produced during the reaction.

The active principle, "*pilocarpina*," has been obtained by various methods. The most simple method is to make an infusion of the leaves, reduce it to a syrupy consistence, mix it with excess of magnesia, evaporate to dryness, treat the mixture with chloroform, evaporate the chloroform, and take up the residue with water. Upon placing the solution in a vacuum, the water is disengaged, and the base remains in the free state as a colorless viscous mass, soluble in water and alcohol. The author details some physiological experiments made with an infusion of the leaves, as also with the alkaloid; his results correspond with the properties claimed for it, and need, therefore, not be detailed here. The author is, furthermore, of the opinion that the plant might be acclimatized in certain parts of Europe, and that it would lose none of its activity thereby. Ph. J. Trans., Dec. 16th, 1876, 496.

Jaborandi, Microscopic Character of Stem.—M. H. Stiles communicates a very interesting paper on the microscopic structure of the stem of jaborandi (*Pilocarpus species*), which is illustrated with several cuts. The paper is not suited for extraction. Ph. J. Trans., Feb. 3d, 1877, p. 629.

*Jaborandi, A Piper, called Jaborandi in the Province of Rio Janeiro.**—A. Gubler draws attention to a jaborandi from the province of Rio Janeiro, which appears to be referable either to *Piper citrifolium* or *P. reticulatum*, and which perhaps should be combined in one species. This plant is a shrub, usually attaining, but sometimes considerably exceeding, a metre in height. The stems are fasciculated at the base, simple, and denuded for half their length, cylindrical, very straight, and articulated like the bamboo; towards the top they bear dark-green leaves that are alternate, shortly petiolate, oval-lanceolate, or slightly obtuse. In the axils of these are sometimes found catkins of male flowers. The figure (29) of the plant is from a sketch drawn by Dr. Jules Crevaux. A supply of the plant, collected by Dr. Da Veiga, of the Brazilian Navy, accompanied the sketch, and has been investigated chemically, physiologically, and therapeutically. Prof. Gubler states that the entire plant exhales a slightly aromatic odor, which becomes more pronounced upon bruising the leaves between the fingers. When chewed, the taste is at first slightly acid, then warm and aromatic, and finally very piquant, and comparable to that of pyrethrum root. This taste is met with in the stems, and especially in the root, where it attains a high degree of intensity, chiefly in the moderately large portions, about the size of a crowquill, which are externally of a rather decided gray color. The more slender and whitish portions are rather insipid, and the finest have hardly any taste at all. These differences are dependent upon the constitution and thickness of the cortical layer, which appears to be the seat of the active principle.

The chemical composition has been studied by M. Hardy, who has demonstrated the presence of an alkaloid and a volatile oil; the latter was obtained, however, in insufficient quantities to study its character. The alkaloid dissolved easily in water slightly acidulated with hydrochloric acid; its solutions gave a white precipitate

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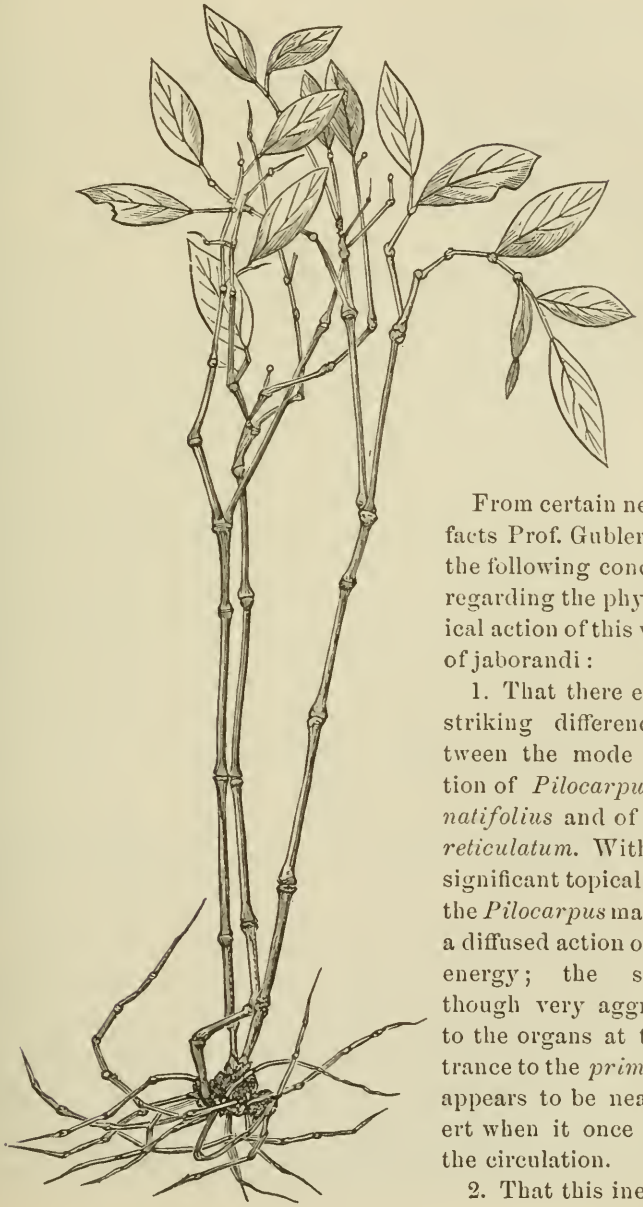
* This "*Piper*" is classified with the "Rutaceæ," because of its intimate connection with the subject of Pilocarpus jaborandi.—Rep.

with iodohydrargyrate of potassium; it appears to be the active principle.

Fig. 29.



From certain negative facts Prof. Gubler draws the following conclusion regarding the physiological action of this variety of jaborandi:

1. That there exists a striking difference between the mode of action of *Pilocarpus pennatifolius* and of *Piper reticulatum*. With an insignificant topical action the *Pilocarpus* manifests a diffused action of great energy; the second, though very aggressive to the organs at the entrance to the *primæ viæ*, appears to be nearly inert when it once enters the circulation.

2. That this inertia of

the *Piper* is more apparent than real, and due to the insufficiency of the doses employed. In future it will be desirable to administer larger doses of the leaves, or, better still, of the root, to obtain physiological effects.

But if the alkaloid discovered by Mr. Hardy is a certain test of the efficacy of the *Piper reticulatum*, experiments made by M. Bochefontaine show that it will be advisable not to seek to obtain the first manifestations through the secretions, as the new agent is a poison of the motor system closely allied to *curare*. Ph. J. Trans., March 10th, 1877, p. 731.

Xanthoxylon Triphyllum, *Local Name in India* "*Chirphul*."—The fruit, as described by W. Dymock, is a small, roundish-ovate, somewhat flattened capsule, about the size of a large pea; it has a fleshy, dotted pericarp, which in the dry drug forms a rough dark-brown aromatic covering to the woody shell inclosing the seed. The small peduncle of the fruit often remains attached. The seed is single, of the shape of a lentil, black and shining. The capsules when ripe dehisce, and the seeds fall out and are thrown away as useless. Upon pressing the pericarp with the nail the essential oil exudes; it has an agreeable lemon odor, and tastes hot and aromatic. Sections of the capsule placed under the microscope show that the outer portion of the pericarp is thickly studded with cells containing the essential oil, and that the elasticity of the capsule is due to the presence of strong bands of spiral fibre. The dry open capsules when soaked in water close and resume the shape which they had before dehiscence. Chirphul is an agreeable aromatic and stimulant; it grows abundantly in the Goa territory. Ph. J. Trans., Dec. 16th, 1876, p. 492.

X. Rhetsa.—The local name of this species of Xanthoxylon is also "Chirphul." The capsules are similar to those of X. triphyllum, but a little larger. They have the same properties. The root is used in Goa as a purgative. It is of a yellow color, and has a yellowish-brown corky bark. Ibid., March 10th, 1877, p. 730.

Xanthoxylon Sp.?—According to W. Dymock, the bark, known under the name "Tejbul," is in repute in India as a stimulant. It is soft, reddish, about five-eighths of an inch thick, in pieces of about the size of the palm of a hand, trimmed, the epidermis being removed and the inner surface scraped; sometimes it is deeply fissured. The structure is like that of cork, only much coarser, which gives it a glistening appearance. The cells are about six

times the size of cork cells. It is slightly aromatic. Ph. J. Trans., July 1st, 1876, p. 4.

Ailanthus Excelsa.—W. Dymock describes the bark of this plant, which in India is known by the name of "Maharook," and is strongly recommended as a tonic in dyspepsia. The bark is very brittle and granular, the external surface brown, marked with scars formed by the exfoliation of dead bark, internal surface of a cinnamon color; numerous nodules of stony cells are visible to the naked eye. Under the microscope the bark is seen to consist of an outer reddish-brown epidermic layer, the cells of which appear to contain resin, a parenchyma of thin-walled cells, which are loaded with starch-granules, and which, towards the outer part of the bark, contain much green coloring-matter; the inner circle of the bark is mostly occupied by the stony cells already mentioned. The odor and taste resemble cinnamon. The alcoholic tincture yields a reddish-brown extract, which appears to consist of wax and resin. Ph. J. Trans., Oct. 14th, 1876, p. 309.

Ainslie had described the bark to be pleasant and somewhat aromatic to the taste. W. Dymock finds it to be intensely bitter, like quinia, and believes it to be a promising drug. The bark is light-colored, very thick and granular, externally hoary and rough from the presence of numerous longitudinal scabrous ridges; internal surface yellowish-white, and finally fibrous; when soaked in water it swells greatly and becomes glutinous on the surface; its odor when moist is acrid and disagreeable. Sections for the microscope show that a great portion of the bark consists of large stony cells collected together in groups. There are also many conglomerate raphides. The large pinnate leaves of the plant are in great repute in India as a tonic, especially in debility after childbirth. The name "Maharook" is also applied to the *Cinnamomum tamala*, by the Concanist gardeners of Bombay. Ph. J. Trans., June 2d, 1877, p. 977.

Ailanthus Glandulosa.—According to J. Dudgeon, the inner white bark of the root of this non-fragrant species of *Ailanthus*, is used in Northern China in a variety of diseases, and has lately been successfully applied by European physicians (Dr. Dugat and others) as a remedy in dysentery. Chinese medical works recommend it as an antidote against sulphur, arsenic, and gold poisoning. It is also said to possess anthelmintic properties, and is also useful in diarrhœa, prolapsus ani, leucorrhœa, gonorrhœa, and, in

short, in fluxes in general. It is intensely bitter and astringent, of a lukewarm taste, free from poison, and emits a disagreeable odor. Ph. J. Trans., Nov. 4th, 1876, p. 372.

MALVACEÆ.

Sida Acuta.—The root of this plant, locally called "Tukali," is in general use, according to W. Dymock, as a diuretic and demulcent, and can be found in all the Goa shops, where it appears to be more used than in Bombay. It is small, woody, and fibrous, the stock not more than one-fourth of an inch in diameter. The bark is of a light yellowish-brown color.

S. cordifolia is sometimes used for the same purpose. The lower part of the stem, with a few leaves attached, may always be found in parcels of these drugs, and enables them to be distinguished one from the other, *S. acuta* having smooth lanceolate and serrated leaves, while those of *S. cordifolia* are cordate and tomentose. Ph. J. Trans., March 10th, 1877, p. 730.

Abutilon Indicum (var., carpels not acute; plant very tomentose, hoary).—According to W. Dymock, the mucilaginous seeds, which are locally named "Bulbij," are generally kept in the Bombay shops, and are supposed to have the property of restoring the virile powers. The plant, obtained by sowing the bazaar seeds, is shrubby, has a hoary appearance, is covered all over with a dense silky tomentum of simple hairs; leaves cordate, unequally and sharply serrated; calyx five-cleft; pedicles axillary, jointed near the flowers, which are of an orange color, and open in the evening; capsules truncated, longer than the calyx; carpels about twenty, not awned, hairy on the dorsum; seeds reniform, about one-tenth of an inch long, and nearly as broad at the larger end, three in each carpel; testa very hard, dull brown, covered with simple hairs rising from a conical base, which is attached to the testa by several radiating processes like roots. Ph. J. Trans., June 2d, 1877, p. 977.

BOMBACEÆ.

Adansonia Digitata.—The local names by which this remarkable tree is known in India, are "Gorukh chentz" or "Churee chentz." It is, according to W. Dymock, not uncommon upon the western coast in the neighborhood of Bombay. The fruit varies much both in shape and size. The shell is hard, woody, and light, clothed

with a dull-green, feltlike down, composed of simple hairs. It is made up of regularly arranged wood-cells, intersected here and there by vascular bundles. The fruit is full of a subacid pulp, which is divided by fibrous bands into a number of compartments. The pulp dries up into a starchlike powder, which adheres together in polyhedral masses, a seed forming the centre of each; these are inclosed in a horny shell, with a rusty red rough exterior, are kidney-shaped, and half an inch in length. The pulp is very mucilaginous, has a pleasant subacid taste, which it retains when dry, and may probably be useful as a demulcent acid refrigerant. The fruit makes floats for fishing-nets and bottles for holding water. The bark of the tree is said by Duchassaing to be a useful substitute for cinchona, although possessing no bitter taste. Its structure is very confused; it consists of a mixture of pitted and wood-cells, without any regular arrangement; the epidermis is scabrous, and appears to consist of desquamating cells of the bark. When fresh, the bark is almost five-eighths of an inch in thickness; a section shows a mottled yellowish-green and reddish-brown surface; internally it is intimately united with the woody fibre of the trunk. Ph. J. Trans., July 1st, 1876, p. 3.

GUTTIFERÆ.

Garcinia Sp.?—W. Dymock describes a specimen of gamboge collected in Canara which he had received from Dr. Davies. The drug, which is there known by the local name of "Arasina Gurgi," occurs in irregular fragments, and appears to have been collected upon leaves, portions of which still adhere to it. The finer pieces have the color and consistence of Siam gamboge, but contain many impurities, such as portions of wood and leaves. Fully half the sample is of a dirty yellowish-brown color, and has a spongy structure; this portion, treated with rectified spirit, gives a clear deep orange solution like ordinary gamboge, but leaves a copious greenish-yellow marc, which appears to be chlorophyll. As at present collected, this gamboge is too impure for commercial purposes. In the Bombay market the ordinary gamboge is alone met with. Ph. J. Trans., Dec. 2d, 1876, p. 451.

Mesua Ferrea.—This handsome tree, with its large cistus-like flowers, is, according to W. Dymock, found in Southern Concan and Goa territory, but is much more abundant in more southern parts of India. It is locally called "Nagchumpa," while the dry

blossoms are known as "Nagkesur" in the bazaars. The bark contains much resinous juice, which exudes freely when it is wounded. The root-bark has a reddish-brown epidermis, consisting of ten or more rows of brick-shaped cells, full of condensed resin. Within the epidermis is a variable number of rows of cells of the same shape, yellow, refractive, and containing resinous juice.

The medullary rays are also yellow and refractive. There are numerous large laticiferous vessels. This bark is mildly astringent and feebly aromatic, but not bitter, as stated in the Pharmacopœia of India. Ph. J. Trans., March 10th, 1877, p. 730.

Calophyllum Inophyllum.—The local name of the plant in India is Woondy. The green oil of the seed—*woondy che tel*—is, according to W. Dymock, valued as an application in rheumatism. The resin is called *woondy cha gond.* The tree grows in the neighborhood of Bombay; the fruit is ovoid and green, and varies in size, being in old trees often as large as a bantam's egg; the pulp surrounding the nuts dries up when the seed is mature, and the previously smooth skin covering it becomes brown and much wrinkled; the endocarp is hard, woody, and white, as thick as the shell of a filbert; within it is an inner endocarp, soft and corky, of a red color, thicker than the woody shell towards the apex of the fruit, but gradually becoming very thin towards the base; the inner surface of this layer is highly polished. The very oily seed has the shape of the nut, somewhat the taste of a rancid filbert, and consists of two cotyledons very closely united. Under the microscope a stroma of small ovoid cells is seen, through which numerous small vessels loaded with green oil run in a longitudinal direction. The resin is translucent, of a greenish-yellow color, softening and becoming sticky when handled, and has an odor like parsley. The author has not been able to ascertain that the resin is ever collected for sale in Bombay, or that any use is made of it by the country people. Ph. J. Trans., Aug. 5th, 1876, p. 110.

Calophyllum Elatum.—This plant, which, according to Prof. W. Dymock, is locally known in Bombay by the name of "Sirpoon," yields a black and opaque gum—much mixed with pieces of corky bark—which has a feebly astringent taste, and is very soluble in cold water. Prof. Lyon, chemical analyst to the government, has been much interested by this remarkable gum, and has communicated to Prof. Dymock the following information: It yields to water a yellow-brown solution, exhibiting a strong blue fluores-

cence. If the gum is steeped in water for some time, the solution becomes very dark in color. Alum, followed by carbonate of sodium, throws down a brown-red coloring-matter without interfering with the fluorescence, as after precipitation in this way the solution, although lighter in color, is very strongly fluorescent. A solution purified by alum in this way has its fluorescence immediately destroyed by acid, and restored by alkalies. Examining its absorption spectrum, it is found that while fluorescent the solution gives a broad absorption-band at the violet end of the spectrum, extending to about G; this band disappears on destroying the fluorescence by acids, but reappears on addition of alkaloids. The solution of gum does not appear to rotate polarized light. The gum itself communicates only a faint fluorescence to rectified spirit. Ph. J. Trans., Dec. 2d, 1876, p. 451.

Calophyllum Spurium.—According to W. Dymock, this tree is abundant in Canara, where it is known by the name of "Babbe," but does not appear to be found in other parts of the Bombay Presidency. It yields a gum which occurs in large translucent irregular lumps of a yellowish color; it is of a horny texture, somewhat brittle, without odor; the taste is soapy. When placed in water it gradually softens, and finally disintegrates into a fine granular matter which floats in the form of flaky particles of a dirty-white color, and numerous oily globules which gradually collect on the surface; the water dissolves a small portion of the gum, and becomes slightly viscid. Ph. J. Trans., Dec. 2d, 1877, p. 451.

AURANTIACEÆ.

Bergera (*Murraya*) *Köningii.*—The bark and leaves of this plant, the Indian name of which is "Kurwa Nimb," or "Karipak," are mentioned in the Indian Pharmacopœia. The leaves, according to W. Dymock, are in common use in India, but more as a condiment than as a medicine; they enter into the composition of curries and green chutnies. The leaves are pinnate, the leaflets 19 to 21, $1\frac{1}{4}$ inch to 2 inches long, alternate, unequally oblique at the base, irregularly ovate, serrated, pubescent, upper surface dark-green, dotted, under surface of a lighter color, venation reticulated, prominent, petioles red, odor powerfully penetrating, taste peculiar, moderately pungent, bitter, and acidulous. The bark has the same taste and odor as the leaves; the thin-walled cells of its parenchyma contain numerous minute oil-globules. The leaves of

Murraya Exotica, a small evergreen shrub, with large white

sweet-smelling flowers, have a pungent taste, and from 5 to 8 elliptic, ovate, tapering leaflets, small like box leaves, acute at the base, shining, coriaceous, and dotted with prominent venation. The bark of this shrub is insipid, but its parenchyma abounds in oil-globules. Ph. J. Trans., Oct. 14th, 1876, p. 309.

VITACEÆ.

Corinthian Raisins.—Prof. X. Landerer communicates the following interesting information regarding the collection and preparation for commerce of the so-called *currants*. The day preceding the festival of the Holy Elias, July 19th, old style (Aug. 2d), is one full of excitement; for on that day thousands of laborers, mainly women, children, and old men, are engaged to commence the harvesting of grapes on the following day, which, in the form of currants, represent for Greece an annual income of 40 to 50 million drachms. There is scarcely another enterprise as profitable, and for that reason all the suitable soil on the Corinthian Bay is converted into vineyards. With merry song the laborers march to the vineyards to prepare on the first day tents and huts from boards and shrubbery. In the meantime the drying-floors, *alonia*, have been prepared by levelling a suitable piece of ground with a mixture of clay and cowdung, not omitting sufficient drainage for a rapid removal of water in case of rain. Many coopers are at the same time engaged in making barrels for packing the raisins, and the merchants who have purchased the product in advance, so far as possible, look anxiously for the arrival of the English steamers, which to the number of thirty or forty usually congregate at the different ports. British gold coins are then used in circulation, and the joy is general, from the carrier of burdens to the wholesale commissioner and merchant, in the expectation of the high wages and profit derived from this monopoly of a portion of Greece and the Ionian Islands. After ten or twelve sunny days the fruit is dry enough to be separated from the stalks and further purified by winnowing, when it is carried to the warehouses for packing and storage until it is shipped, the weighing and packing being done under the supervision of government officials. Each shipmaster is anxious to secure the first cargo, and the departure of the vessel carrying the so-called *primaroles* is the occasion of festivities, adorning of the ship with wreaths and firing of cannon. But throughout the general joy, the anxiety of many is plainly visible, lest a heavy rain might be the cause of disappointing the hopes and expectations of thousands of families. Regarding the

Culture of grapes in Greece, the author says that more than fifty varieties are cultivated, yielding as many different wines. A number of years ago attempts were made to transplant the valuable grape-vines of Hungary and Germany to Greece; but though they flourished in the sunny Oriental clime, acidulous grapes from the Rhine became rich in sugar, and produced a wine resembling those obtained from indigenous grapes, and the latter acquired a harsh and acid taste when cultivated in Southern Germany or on the Rhine. The proverb, "Suum cuique," is probably also applicable in this case. A. J. Ph., April, 1877, p. 157.

Vitis (Cissus) Latifolia.—This large climbing plant, locally known under the name of "Kole Zan," is very common in the Bombay Presidency, according to W. Dymock. It has perennial tuberous roots; fruit like bunches of small black grapes; the whole plant reminds one of the vine. The roots form large bunches of tubers attached to a central root-stock; the tubers are from one to two feet long, tapering at both ends, with a maximum diameter, when fresh, of from two to three inches; externally they are covered by a light-brown epidermis, and marked with small wartlike protuberances arranged in circular rings; internally they are red and juicy. A section shows a thick stringy cortical portion, easily separable, and a fleshy part of the consistence of a parsnip. Under the microscope the root is seen to be made up of a thin-walled parenchyma, the cells of which contain large oblong starch-granules and numerous bundles of needle-shaped crystals; the outer portion of the root and root-bark is traversed by numerous very large fenestrated vessels. The taste is sweetish, mucilaginous, and astringent. The dried tubers are used by the country people, in the form of a decoction, as an alterative. Ph. J. Trans., Oct. 14th, 1876, p. 309.

Ampelopsis Hederacea.—The details of two cases of poisoning by the well-known Virginia creeper, or American ivy, have been communicated by Bernays. The sufferers were two children, aged respectively two and a half and five years, who had chewed some of the leaves of the plant, swallowing only the juice. They were quickly seized with vomiting and purging, with considerable tenesmus; then collapse, sweating, and faint pulse, followed by deep sleep for two hours, from which they were aroused by a return of the vomiting and purging. Milk, with some rum mixed in it, was freely administered, under which treatment the children soon recovered; but four hours after the commencement of the attack there was

still considerable dilatation of the pupil. Ph. J. Trans., July 22d, 1876, p. 80.

ERYTHROXYLACEÆ.

Erythroxylon Coca.—The accompanying illustration is a very good representation of the plant which is now again prominently attracting the attention of the medical world, owing to its alleged power of relieving or preventing muscular fatigue, and of taking the place, to some degree, of food. The plant from which the drawing (Fig. 30) is made is an inhabitant of the Royal Botanic Gar-

FIG. 30.

dens, Regent's Park, London, where a number of samples exist. So far as can be discovered, it is a very variable plant. In English nurseries it grows in the form of a shrub, three to four feet in height. Some of the specimens are much branched, and the leaves

differ very much from each other, both in size and shape. The plant is said to be easily cultivated in an ordinary plant-stove, in a compost of fresh fibrous loam, leaf mould, and sand. When growing, it requires copious supplies of water at the root, and frequent syringing with water, to keep down insect pests. Cuttings of both stem and root may be employed for purposes of propagation. There are about seventy species of Erythroxylon, some of which have stimulating qualities, while others furnish a tonic bark somewhat resembling that of cinchona. The bark of one species, E. tuberosum, supplies a reddish dye. The majority of species are natives of South America and the West Indies, but others are found in Madagascar and the Mauritius. In nearly all the species a distinct pale band runs up the centre of the back of the leaf, as shown in the engraving; indeed, in some descriptions of the leaf of the coca plant, it is stated that two veins, in addition to the mid-rib, run parallel to the margin, as in melastomads. New Rem., Jan. 1877, p. 1.

SAPINDACEÆ.

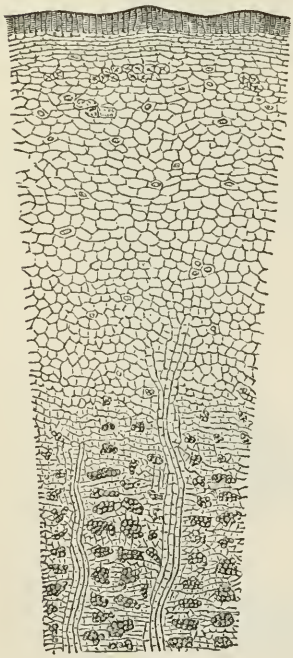
Paullinia Pinnata, *Lin.* (*Timbo*).—The properties and chemical composition of "Timbo," a Brazilian plant, which is very closely

FIG. 31.

related to the plant yielding the "Guarana," is the subject of a paper by Mr. Martin. Plants belonging to the *Sapindaceæ* are

very common in Brazil, and comprise both trees and climbing shrubs. Some have such poisonous properties that the natives use their juices as arrow poisons, while others are innocuous or simply narcotic. To the latter class belongs the "Timbo," a tree found in Brazil, Mexico, the Antilles, and Guiana. The leaves are composed of five leaflets, oval, lanceolate, and crenulated (Fig. 31). The flowers are polygamous, diœcious, and have five, or, rarely, four, parts; an imbricate calyx; four unequal petals, furnished with scaly appendices; eight stamens, situated around a disk, with notched edges; ovary with three styles, containing three seeds, and commonly one which has aborted, which is provided with an arillus, and contains under its envelope an embryo without albumen. The bark of the timbo-root is the only part used in Brazil; it is of a yellowish-gray color, and variable in length and thickness. In transverse section (Fig. 32) one observes, from outside inwards, 1st. An exterior layer of periderm, composed of numerous masses of corky tissue. 2d. On reaching the central parenchyma, one recognizes here and there small masses of hardened cells (that is to say, having early incrustations); this element is frequent in the bark and in this situation. 3d. A very thick layer of cortical parenchyma, in which the cells are distended with starch. 4th. In the midst of this parenchyma, cells containing a resinous material. 5th. Bundles of bast-fibre arranged in interrupted lines, and mixed with rays of the medulla. This bark is with difficulty reduced to powder. Five grams of this bark will absorb, cold, fifteen grams of distilled water.

Fig. 32.



The bark of timbo-root has an agreeable aromatic odor, slightly resembling musk. In Brazil it is employed externally. Poultices are made from it with boiling water, which are applied to the side in affections of the liver. It often causes intense eruptions, in which case the application is discontinued.

Mr. Martin has isolated from the root-bark, starch, resin, an essential oil, chlorophyll, tannin, an organic acid, traces of glucose, and an alkaloid, to which he has given the name of *timbonin*. By first treating the finely powdered bark with bisulphide of carbon, the extraction of the alkaloid and other principles is facilitated. The *sulphate of timbonin* crystallizes in white needles. New Rem., May, 1877, p. 142, from Bull. Gén. de Thérap.

PAPAVERACEÆ.

White Poppy, Cultivation in England.—According to E. M. Holmes, the culture of this plant at Banbury is attended with much trouble and expense. The seed has to be selected very carefully, for singularly the poppy shows a constant tendency to "sport," and if left to itself, the flowers of the white poppy become colored in a few generations. The size of the capsule decreases and the color of the seeds and flowers becomes darker in proportion, until at length the flowers become purplish-black, and the seeds quite black. Mr. Usher, the cultivator, accounts for this fact by supposing that insects carry the pollen from the wild red poppy (Papaver rhœas) to the white one. In order to get large capsules, only the very whitest seeds are retained, and they are sown in rows twenty inches apart. When young the plants require constant weeding. The capsule, when the flower has fallen, is about the size of a walnut, and then grows to the size of an orange in the short space of ten days, although it takes nearly five weeks to ripen. Each plant bears two or three capsules. The harvest is collected during the last week in August or the first in September. They are dried in malt-kilns, in which a wagon-load forms a layer a yard deep, and they become dry in about twelve hours. Ph. J. Trans., June 16th, 1877, p. 1018.

Opium, Morphiometric Assay.—James Lynn has assayed four samples of opium, each by four processes, viz.: Procter's Staples' process, which is entirely the method of the Pharmacopœia for preparing morphia; Mohr's process, which is given in the U. S. Dispensatory; Hager's Jacobson's process, which is found in "Am. Jour. Pharm.," 1871, p. 224 (see also "Proceedings," 1874, p. 142), and is found in Mohr's method; and Dragendorff's Mayer's process, which consists in exhausting the opium with benzin, drying, then exhausting with water by maceration and percolation, acidifying with sulphuric acid, and determining the quantity of morphia volu-

metrically with solution of iodohydrargyrate of potassium. The three first-mentioned processes are gravimetric, and of these three, the author gives preference to Staples' process as yielding the purest product, and, therefore, probably most accurate results. Such being his view, it is difficult to conceive how he can give, as seems evident, preference to Dragendorff's volumetric method, simply because it gives a larger percentage than the gravimetric methods. The volumetric method is doubtless reliable if we have but one alkaloid to deal with, but where there are several alkaloids present, as is the case in opium, the result indicates possibly the total quantities of alkaloids present in a solution (and even then, it is difficult and perhaps impossible to determine accurately, owing to their variable proportions and difference in atomic weight), but never morphia alone. The three gravimetric methods yield pure morphia, but it is not likely that any of these yield absolutely accurate results.

PERCENTAGES OBTAINED.

PROCESS.	No. 1.	No. 2.	No. 3.	No. 4.
1. Procter's Staples', ...	11.22	13.62	9.14	12.69
2. Mohr's, ...	11.40	13.48	9.30	12.77
3. Hager's Jacobson's, ...	11.68	13.86	9.46	12 98
4. Dragendorff's Mayer's, . . .	12.33	14.00	10.40	13.06

A. J. Ph., August, 1876, p. 358.

T. M. Stewart has applied the volumetric method to the elimination of morphia and emetia in *Dover's powder*, the alkaloids being also eliminated gravimetrically. The results were confirmatory of each other, but the gravimetric method differs from any of the three above mentioned. The powder is extracted with 85 per cent. alcohol, the alcoholic solution is evaporated, the residue dissolved in acidulated water, filtered if necessary, narcotina removed by washing with ether, and then shaken with carbonate of barium in excess. The solution is now extracted with benzin, which takes up the *emetia* and leaves it upon evaporation. After complete exhaustion with benzin the solution is mixed with amylic alcohol, which removes the morphia, and yields it on *evaporation*. The percentages of the two alkaloids so obtained were confirmed by dissolving them separately in acidulated water and triturating with iodohydrargyrate of potassium. Eight samples of Dover's powder examined, yielded by this method:

Morphia in quantities varying between 0.96 and 1.06 per cent. (average 1.01 per cent.).

Emetia in quantities varying between 0.13 and 0.23 per cent. (average 0.19 per cent.). Ibid., p. 359.

Opium, Qualitative Examination.—Lepage and Patrouillard give the following process: Reduce 0.10 gram to powder in a mortar, and suspend the powder in 25 grams of distilled water; leave the mixture in contact during half an hour, agitating occasionally, and then filter. Take two-thirds of this liquor, which should possess a markedly bitter taste, and pour into it some drops of solution of iodide of cadmium and potassium (see Qualitative Examination of Cinchona). If the opium be of good quality and abundant, turbidity is produced, to which rapidly succeeds a flocculent precipitate; whilst if it contain not more than four or five per cent. of alkaloid or less, at the most a slight turbidity is produced. The one-third part of the solution that is reserved, when tested with very dilute perchloride of iron, ought to acquire a decided red color, which is the reaction characteristic of meconic acid. Ph. J. Trans., March 31st, 1877, p. 795.

Papaver Rhœas, Examination of the Juice of the Fruit Capsule.—O. Hesse was induced to examine the milky juice that exudes from the unripe fruit capsule of Papaver rhœas upon being scratched, by a statement of Selmi, that these unripe capsules contain an alkaloid similar to morphia. The juice collected in the morning under a cloudy sky gave 35 per cent. of dried residue at 100° C. (= 212° F.); some obtained after half an hour's violent storm gave only 34 per cent. The milky juice is at first mostly white, sometimes, however, it is of a beautiful citron-yellow color, and then quickly changes in the air to a dark-brown. Ferric chloride produces with it an intense red color, probably indicating the presence of meconic acid. 4.4 grams of dry residue examined by trustworthy methods *gave no trace of morphia or an alkaloid similar to it;* whereas, 0.090 gram gave equal to 2.1 per cent. of *rhœadina* and traces of another partially crystallizable alkaloid, to which the author promises to return on a future occasion. As rhœadina is the principal alkaloidal constituent of these fruit capsules, the author considers it would have been present in the "new substance" that Selmi prepared from this *Papaver*. Rhœadina is not colored by ferric chloride, but agrees somewhat with morphia in being almost insoluble in ether. Ph. J. Trans., May 5th, 1877, p. 894, from Liebig's Annalen.

Argemone Mexicana.—The plant, locally known as "Daruri" and "Peela Dhotra," is found abundantly on waste ground in Bombay. W. Dymock speaks favorably of the oil of the seeds as a gentle aperient, free from taste, in doses of 30 to 60 minims. The unfavorable reports of some medical men are probably caused by adulteration, it being necessary in India to express your own oil if you wish to get it free from adulterants. Dr. R. Haines, of Bombay, has analyzed the whole plant in flower, but failed to obtain a trace of an alkaloid. An extract of the plant was found to be aperient only. Ph. J. Trans., August 26th, 1876, p. 171.

CRUCIFERÆ.

Nasturtium Officinale.—The analysis of this plant by A. H. Church has furnished additional proof that water and swamp plants possess the property of assimilating considerable quantities of mineral substances. 100 parts of the plant yielded 1.28 ash, and besides 93.11 of water, 1.50 albuminoids, 2.92 starch, sugar, gum, 0.66 cellulose and lignose, and 0.53 chlorophyll and fat. The volatile oil, which is obtainable by distillation, contains much nitrogen, but no sulphur. Arch. Ph., Jan. 1877, p. 61, from Jour. of Botany.

Mustard Meal.—F. Schneider draws attention to the value of mustard meal as a deodorant; it answers an excellent purpose for washing the hands after operating with cod-liver oil, musk, valerianates, etc., and also deodorizes the vessels used perfectly. Schw. Wochenschr. f. Ph., No. 11, 1877, p. 84.

Referring to Schneider's observation, A. Huber remarks that this property of mustard meal is common to all seeds that are rich in oil, and that linseed will answer the purpose as well. The advantage of mustard meal, if any, is probably due to the volatile oil produced in contact with water. Ibid., No. 13, 1877, p. 104.

CAPPARIDACEÆ.

Cratæva Religiosa.—The local name in Bombay of this small tree, according to W. Dymock, is "Vaivarna." It has 3-foliate leaves on long petioles, leaflets lanceolate, acuminate, thin, smooth, upper surface dark green, under of a lighter color, about eight inches long and three broad. The green bark of young shoots and petioles of leaves is marked with small white prominent specks. The bruised leaves have a disagreeable odor, something like helle-

bore; they are slightly bitter and very pungent, causing a tingling sensation in the tongue; not aromatic. In Bombay the bruised leaves are used as a remedy for swelling of the feet and burning of the soles, and are popularly considered to be efficacious in such cases. Ph. J. Trans., Oct. 28th, 1876, p. 350.

Gynandropsis Pentaphylla.—The juice of this plant, locally known in Bombay by the name of "Kanphootee," is used, according to W. Dymock, in purulent discharges of the ear. It is a very common plant on cultivated ground; leaves five-foliate, with obovate leaflets; flowers white; stamens very long, purple; capsules round, tapering towards the point, which is surmounted by the style. The whole plant is viscid and is covered thickly with glandular hairs; it has a strong, peculiar odor, something like the essential oil of mustard. The seeds are black, smaller than mustard, and rough from numerous little hornlike projections; they have scarcely any taste. The leaves have an acrid, peppery taste. Ph. J. Trans., Dec. 2d, 1876, p. 452.

Polanisia Icosandra.—The local name of this annual weed in India is, according to W. Dymock, "Kanphootee." The plant is one or two feet high; leaves 3–5 foliolate; leaflets obovate; flowers yellow. The whole plant is pubescent and extremely viscid; the hairs are surmounted by a round gland, from which a reddish viscid excretion exudes. It has a powerful odor, like a mixture of black currants and oil of mustard. The juice is used in purulent discharges of the ear. Ph. J. Trans., Aug. 26th, 1876, p. 171.

BIXINEÆ.

Hydrocarpus Inebrians.—The plant, locally known by the name of "Kowtee," is, according to W. Dymock, abundant in the Concans some distance to the south of Bombay, and also in Goa. An oil is extracted from the seed, which is used for burning, but is also in repute as a remedy for skin diseases, and is at present on trial as a substitute for chaulmogra oil. It appears that the greenish tinge which the oil sometimes has is caused by the adherence of some of the pulp of the fruit to the testa of the seed; the pure oil from the decorticated seed is of a pale-yellow. The external appearance of the fruit varies very considerably; upon the same tree perfectly smooth and very rough fruit may be seen. Ph. J. Trans., March 10th, 1877, p. 730.

CRASSULACEÆ.

Kalanchoe Pinnata.—The fleshy leaves of this plant, locally known in Bombay as "Airwan-mairwan" and "Ghaimari," are used by the natives, according to W. Dymock, as an application to boils, wounds, and the bites of venomous insects, etc. Their taste is strongly acid and astringent, and they are applied, after slightly heating and crushing them, as a poultice. The plant is tall, fleshy, erect, suffruticose; the leaves are thick, ovate-crenated, consisting of one large leaflet and two smaller ones; petiole and margin of leaf purple; blossom a terminal panicle of pendulous, tubular, yellowish-red flowers. Ph. J. Trans., Dec. 16th, 1876, p. 49.

CUCURBITACEÆ.

Colocynth, Application of the Microscope to the Detection of Adulterations of the Powder.—An interesting paper on this subject is communicated by William Inglis Clark, who finds that commercial powdered colocynth often contains a considerable proportion of the powdered seeds, occasionally some of the rind, and sometimes also a large proportion of wheat starch, in one instance noted as much as 75 per cent. It is difficult to exclude the seeds completely in powdering the colocynth pulp, and these are more prominently characterized by the peculiar albuminous granules they contain. With a view to facilitating a comprehension of the author's method of detection, he briefly describes the various tissues which are present in the pulp itself, the rind, and the seed, the accompanying cut (Fig. 33) illustrating the various parts described.

The seed consists of a hard outer layer or episperm, and a soft part inside, the embryo, which in this case is exalbuminous. A very thin section through the outer layer of the seed presents a superficial layer of epidermis, below which are stellate cells, shaped much like a jelly-mould, and consisting of a raised-up central portion, having ridges or folds of the cell-wall radiating from the centre. This structure is at once shown by an examination of the transverse section, from the lower or inner side. If a section be made of any spherical body, it is evident that at the margin of the circular slice obtained, the section will be very thin, while in the centre it will be thickest. If, therefore, we look from below (*i. e.*, from the flat side) at such a section, through the stellate cells above referred to, we shall see at the margin only the outline of the cells themselves, hexagonal or otherwise, as the case may be,

while as we gradually approach the centre, the ridges will appear at first as mere dots, finally developing into well-marked rays. Such corresponding exactly with what is seen in the section represented in the diagram, it is concluded that the cells have the shape indicated. This is even more fully borne out by the isolation

Fig. 33.

of individual cells by means of potash solution, when the structure is well seen, and the rays stand out prominently. As we proceed deeper into the seed, we come upon several layers of dotted cells, more or less hexagonal in section, and having very thick, striped cell-walls. These constitute the hard part of the seed, and are thickened by deposits of ligneous matter in them. Closely investing the inner side of this hard layer is a very thin layer of tissue, the cells of which are much flattened, and nearly resemble Fig. *a* in the diagram. This layer is not truly separable from the episperm. If a seed, after being steeped in water for some time, or better still, in solution of potash, be opened, and the embryo removed, a very thin-walled sac will be readily separated from the included cotyledons. On examination, this will be found really to consist of two tissues, not readily separable, each consisting of a single layer of cells. The outer, represented by Fig. *b*, consists of elongated narrow hexagonal cells, and is often met with in the

commercial powder. The inner, in like manner, is also to be found, and in structure (Fig. *a*) much resembles the inner layer of the episperm, previously referred to. Between these, however, and the episperm are to be found spiral vessels, forming a kind of sheath around the embryo and its coverings. We now come to the cotyledons, the structure of which can be seen in the transverse section. This is especially interesting, as showing us, not only what the structure of cotyledon really is, but also its complete homology to an ordinary leaf. First of all, then, there is an epidermal layer of irregular, flattened cells, shown in Fig. *d*, covering both the inner and upper side, and the outer or lower side, and even at this comparatively early stage, stomata, well developed and capable of contraction and dilatation, are to be found leading into loose spaces among the cells, and, no doubt, to some limited extent carrying on the functions of transpiration and respiration. This epidermal layer, with the stomata, is exceedingly difficult to separate, or even to examine *in situ;* for, it being of extreme tenuity, the cells below are readily visible through it, in most cases rendering it impossible to detect such a tissue. If the albuminous cells, however, be very carefully removed, such a structure is observed as has been above referred to. Immediately below the stomata there are two layers of small cells, measuring about $\frac{1}{1600}$th inch in diameter, and underneath there are one or two palisaded layers, viz., layers of very regular elongated cells, hexagonal in section. Now come a considerable number of rounded cells, followed by three palisaded layers and a single row of small cells covered by the epidermis. Besides this general structure, the author, however, directs special attention to this fact, that all the cells of the cotyledons are filled with a very large number of small, oily, albuminous granules, about $\frac{1}{8000}$th inch in diameter, represented as Fig. *e* in the diagram. These must not be mistaken for starch, as has been done, for the form is much more rounded than is usually found in starch-grains, and the absence of blue color with iodine, as well as the behavior with polarized light, at once show the difference. These grains constitute the nutritive portion of the seed, and are able to withstand the action of solution of potash. By gently pressing the cells containing them with a little water the cell-walls are ruptured, and the little granules as they float about are so characteristic as to be an infallible proof of the presence of the seed in a sample of powder.

The rind is of a light-yellow color, and is comparatively thin.

The epidermis (see diagram, *f*) when carefully removed is rather a pretty microscopic object, exhibiting as it does irregularly flattened cells, with thickish cell-walls and numerous stomata. If examined by a transverse section, it will be seen that the stomata are raised above the general surface, and open into loose spaces among the cells. These cells, underneath the epidermis, resemble much in appearance the thickened cell of the episperm, previously described, but are larger, looser, and with narrow cell-walls.

The pulp, on the other hand, consists of the most irregular cellular tissue, the cells, which are easily separable by means of potash, being oval or elliptical in form, and lying together in no very definite order. This pulp is traversed by vessels of various kinds, the most important of which to remember are the spiral vessels, which are of large size, larger as a rule than the corresponding structures in the seed, but as size is no criterion, it is necessary to remember that the same structures are present in both parts, and that, therefore, the presence of spiral vessels in the powder is no proof of the presence of the seed. The tests to be relied on for the determination of the presence of seeds in the powder are the peculiar albuminous granules contained in the cells of the cotyledons, and the double-walled sac enveloping the embryo (Figs. *b* and *a*), showing on the outer side elongated, more or less hexagonal cells, and on the inner side, the structure shown in Figure *a*. The rind is seldom present, but the characteristic stomata, which in this case are easily seen, furnish a ready means of detection. Of foreign substance, starch is most commonly used, and may readily be detected. A few grains, here and there, may be present accidentally (from the mill in which it is ground), but if present in reasonably large proportions, its presence may be safely regarded to be intentional. These are readily detected under the microscope by their well-known character. In the diagram, Fig. *h* shows a wheat-starch granule, in its relation parts of the colocynth seed and rind described, the view of the granule being from the side. Ph. J. Trans., Dec. 23d, 1876, p. 511.

Pumpkin Seed, Composition.—Dorner and Wolkowitsch had in 1870 subjected pumpkin seed to chemical examination, and determined, besides resin, fixed oil, albumen, sugar, coloring-matter, and starch, a peculiar crystalline body, which they believed to be a glucoside, and which they named *cucurbitin;* they also observed traces of volatile oil. Nicolai Kopylow has recently repeated the experiments then made, and obtained in the main similar results,

but finds that the crystalline principle, cucurbitin, is not a glucoside. The fixed oil has been determined to consist of the glycerides of palmitic, myristic, and oleic acids. The oil extracted by ether contains also free fatty acids. Ph. Zeitschr. f. Russ., No. 17, 1876, p. 513.

Pumpkin Seeds, Analysis.—Nicolai Kopylow has ascertained that these seeds contain no alkaloid, nor could the presence of a glucoside be established, which, by Dorner and Wolkowitsch, was supposed to exist therein, and named by them cucurbitin (1870). The last-named authors have found 44.50 per cent. of fixed oil, 32.75 per cent. of starch, and traces of volatile oil, resin, sugar, and coloring-matter. Kopylow ascertained the fat to consist of the glycerides of palmitic, myristic, and oleic acids, and the fat extracted by ether also to contain free fatty acids. A. J. Ph., Jan. 1877, p. 23; Ph. Zeitschr. f. Russ., 1876, No. 17.

Cucurbita Maxima.—According to Heckel, the tæniafuge properties of pumpkin seed reside in the persiperm. Ferd. Vigier, however, states that the seeds lose nothing of their activity by being deprived of their perisperm, according to his experiments made with the seeds of *Cucurbita maxima*, which is the species frequently met with in Paris. He proposes an emulsion from 60 grams of the seeds deprived of the perisperm, 20 grams of sugar, 10 grams of orange-flower water, and 160 grams of distilled water. This potion is followed by a purgative. A. J. Ph., Nov. 1876, p. 509, from L'Union Pharm.

Bryonia Laciniosa.—W. Dymock states that the whole plant, which is locally called "Kawale che Dole," is used in Bombay medicinally; it is bitter and aperient, and is considered to have tonic properties. It is a climbing vine; stem smooth; leaves palmately five-lobed; more or less deeply divided; segments oblong, lanceolate, acuminated, serrated; petioles muricated, upper surface of the leaves thickly studded with white jointed calcareous hairs rising from a calcareous areola; male and female flowers in the same axils, the peduncles of the male flowers, which are numerous, remaining until the fruit ripens; fruit round, smooth, red, with white streaks, the size of a marble. Ph. J. Trans., Jan. 6th, 1877, p. 550.

Luffa Amara.—The local name of this vine, in the Bombay Presidency, according to W. Dymock, is "Ran Turai." The leaves, which are bitter, are used as an external application to the sores

of oxen; the fruit is smooth, from 3 to 5 inches long, ovoid, marked with ten prominent, sharp, longitudinal ridges. At the apex of the fruit is a small operculum, rather more than half an inch in diameter, which is deciduous. Internally it is filled with white spongy pulp, of a cucumber odor. The seeds are gray and marked with small, irregular, black, prominent specks. The fruit is only slightly bitter. Ph. J. Trans., Dec. 2d, 1876, p. 451.

Trichosanthes Cucumerina.—The Indian local name of the plant, according to W. Dymock, is "Iangli Pudwal." Its leaves are broadly cordate, generally seven-lobed, serrated, fetid; tendrils three-cleft; flowers like those of the cultivated snake-gourd; fruit 3 to 6 inches long, ovate, pointed at both ends, greenish-white, marked with broken longitudinal lines of darker green; seeds large, from twenty to thirty, surrounded by a thin, fetid, bitter, watery pulp. The natives consider the fruit to be antiperiodic. It abounds in the Concan, and matures in September and October. The plant is noticed in the Pharmacopœia of India under the name of *T. cordata*, and the root is said to be used in Bengal as a tonic. Ph. J. Trans., 28, 1876, p. 351.

Trichosanthes Palmata.—According to W. Dymock, the plant is sometimes smoked by the natives of India as a remedy for asthma, but nothing definite appears to be known of its medicinal properties. It is locally known by the name of "Koundal." It is a perennial vine, often as large as the middle finger, has a warty gray bark marked by seven deep longitudinal fissures, which correspond to the medullary divisions between seven wedge-shaped vascular bundles into which the stem is divided, and bears a round, oval, or pyriform fruit, the size of a small apple, of a dirty-yellow color, marked at one end by a cicatrix with sharp, raised edges; at the other there is a prominence to which a portion of the stalk sometimes remains attached. In the dry fruit, which has a thin, brittle, very bitter shell, the segments of pulp with their seeds are loose, so that when dry the contents of the gourd rattle. If a dry segment be soaked in water it soon softens, yielding a dark-green pulp, which smells like savin and has an acrid bitter taste. The seeds are flat, but very irregular in shape, generally somewhat triangular, average seven-sixteenths of an inch in length, have a hard shell and an oily kernel. The vine is not bitter. Ph. J. Trans., Aug. 26th, 1876, p. 170.

Megarrhiza Californica, Torrey.—J. P. Heaney has analyzed

the root of this plant, which is a herbaceous, climbing, succulent vine, growing abundantly throughout California, and known by the synonyms of the "big or giant root, and manroot." The plant is remarkable for its gigantic root, which is perennial, tubero-fusiform, externally of a yellowish-gray color, and rugose; within white, succulent, and fleshy, of a nauseous odor, which is lost in a great measure on drying, by which also it loses 70 to 75 per cent. of its weight. The dried root is externally yellowish-brown, longitudinally wrinkled; internally white, becoming somewhat darker by age, and concentrically striated. It is light, brittle, and readily powdered, yielding a whitish powder.

The author's investigations prove the root to contain, besides tannic acid, gum and pectin: 1. An *organic acid*, probably fatty in its nature; 2. A *neutral fatty matter;* 3. A peculiar resin, *megarrhizitin*, which is soluble in alcohol and ether, and is unaffected by alkalies and solution of sulphate of copper; 4. A bitter principle, *megarrhizin*, which proved to be a glucoside, being split by the action of boiling dilute acids into glucose and a body of dark-brown color, having a resinous appearance, and being soluble in alcohol, but only partially soluble in ether. This the author names *megarrhizioretin*. The glucoside, *megarrhizin*, as obtained by the author, is brownish, somewhat transparent, brittle and friable; yields a yellowish-brown powder; melts at 100° C. (= 212° F.); is inflammable; soluble in water and more soluble in alcohol, forming intensely bitter solutions. Sulphuric acid dissolves it slowly with production of first a bright red and afterwards brown color; hydrochloric acid produces a faint violet color; nitric acid a dull yellow color; ferric chloride produces in its aqueous solution a deep color, but no precipitate; and it is not changed by acetate or subacetate of lead, corrosive sublimate, solution of iodine, potassa or its carbonate, or nitrate of silver. Tannic acid produces a bulky, gelatinous precipitate; bromine water a white, insoluble precipitate. The author regards the principle as closely allied to colocynthin and bryonin, with both of which it has some identical characters.

The megarrhiza root has, among the Indians, a reputation as a drastic purge, and it is used by domestic practitioners in California as a laxative and cathartic with good results. A sample of an alcoholic extract as also some of the bitter principle—megarrhizin—was experimented with physiologically by a physician, who finds the extract to be a drastic hydragogue cathartic, causing nausea,

sometimes vomiting, griping pain, and watery stools in doses of $\frac{1}{4}$ to $\frac{1}{2}$ grain. Given in large doses it is a powerful irritant, causing gastric enteritis and death. When given in small doses, frequently repeated, it is a diuretic and laxative, and is considered a safe and valuable purgative in all cases where it is desirable to produce energetic action on the bowels. The bitter principle seems to be the active constituent. A. J. Ph., Oct. 1876, pp. 451–454.

COMBACTACEÆ.

Terminalia Bellerica.—The local name of the plant, in India, is *Yella;* of the gum, *Yella cha gond.* The latter, according to W. Dymock, occurs in vermicular pieces, about the thickness of a finger, and of the color of inferior gum arabic. It is scarcely soluble in water, in which it swells up, however, forming a bulky gelatinous mass; its taste is insipid. Ph. J. Trans., Aug. 5th, 1876, p. 110.

MYRTACEÆ.

Eucalyptus Globulus.—The following constituents of old leaves have been obtained by Hartzer: An acid resin yielding, with sulphuric acid, a copulated acid of a handsome carmine color, and becoming violet on the addition of ether; two resins which are not colored red by sulphuric acid; a new fatty acid, crystallizing in fine needles, the sodium and potassium salts of which are soluble in ether; tannic acid and cerylic or a similar alcohol. A. J. Ph., July, 1876, p. 329, from Ber. d. Chem. Ger., 1876, p. 273.

Eucalyptus Globulus.—It is stated in "Chronique Horticole de la Société Hort. de l'Ain," that branches of Eucalyptus globulus, contained in a vessel with water, will drive off flies and gnats from the rooms. Zeitschr. Œst. Ap. Ver., Sept. 10th, 1876, p. 414.

Psidium Pomiferum.—W. Dymock describes the bark, locally known in India as "Peroo." The external surface when fresh is brown and smooth, marked by superficial scars, indicating the separating of squamous plates of dead bark. These plates sometimes remain partially attached. Beneath the brown epidermis the bark is green; its inner surface is marked by longitudinal striæ, and is of a light-brown color. Sections show that it consists of an epidermis made up of two rows of brick-shaped brown cells, and alternate rows of vessels and parenchymatous cells, varied towards the inner part by three broken circles of liber cells. The

medullary rays are numerous, and together with the parenchyma of the outer part of the bark loaded with greenish coloring-matter; in the rays this extends some distance into its substance, and makes them very conspicuous. The vascular system is loaded with crystalline deposit, to which most likely the agreeably acid taste of the Guava bark is due, it being probably an acid salt of lime and potash. Ph. J. Trans., Aug. 26th, 1876, p. 171.

Barringtonia Acutangula, Local Name in India "Samundar Phal."—According to W. Dymock the seed of this tree resembles the nutmeg in size and shape; externally it is somewhat rough, brown, and marked with longitudinal striæ; internally it is of a chocolate color, hard and brittle when dry, but easily softened by immersion in water, when a section for microscopic examination can readily be made. A small central cavity of an oval form contains the germ; the rest of the seed consists of starch. The granules are small, and their natural form, which appears to be oval, is much modified by compression; they are contained in a delicate cellular stroma. Samundar Phal is considered by the natives to be warm and stimulating; it has a starchy taste; in Bombay it is generally prescribed with other and more active medicines. Ph. J. Trans., Dec. 16th, 1876, p. 493.

ROSACEÆ.

Rosa Gallica, the Coloring-matter of the Petals.—Harold Senier has made some interesting chemical investigations of the coloring-matter of rose leaves, which appears to have the characters of an acid. The dried petals of commerce were first digested with ether, by which treatment *quercitrin*, the yellow coloring-matter, and solid fat are removed (Filhol). The so extracted petals were now extracted by alcohol, which dissolves the coloring-matter completely, but forms a colorless solution, owing, as the author thinks, to some reducing action of the alcohol; the alcoholic solution in time acquires a red tint, which brightens by age. From this alcoholic solution the coloring-matter is precipitated in a green, amorphous state, by acetate of lead, from which the coloring-matter may be isolated either by treatment with sulphhydric acid, or by the action of dilute sulphuric acid, the latter method affording, however, a purer product. Dilute acids deepen the color of the solutions so obtained, but concentrated acids decompose it, concentrated nitric acid yielding a yellow solution. Alkalies change the color from a bright red to a

deep red, with a bright-green fluorescence, and when added in excess give a yellow solution. A drop of solution of *soda* and a drop of solution of coloring-matter, placed on a glass slide and slowly evaporated by a gentle heat, yield under the microscope a mass of

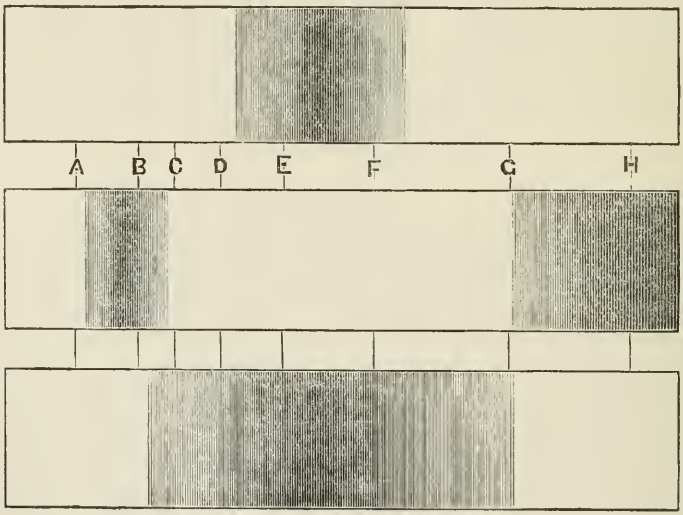
FIGS. 34, 35, 36, 37.

well-defined crystals, marked 1; *potash* yields crystals when treated in the same manner, see No. 2; *ammonia* itself does not give crystals, but combined with soda gives the forms shown in No. 3, and with potash the form No. 4, which are perfect octahedra. These crystals, under the microscope, if treated with an acid, yield the coloring-matter in the red form, thus showing that they are actual combinations of the coloring-matter. *Alkaline carbonates* act in the same manner as alkalies, except that the change of color is accompanied with effervescence. *Chlorine* entirely destroys the red color, leaving a yellow solution. *Sulphhydric acid* changes the red to brown, but so far as the author has been able to determine, does not alter the chemical character of the solution. *Stannic chloride* changes the red to a beautiful dark magenta color. On boiling with *metallic mercury*, the red color is changed to a dark violet or purple. *Mercuric nitrate* and *chloride* both give a slight white or pinkish precipitate, soluble in water. *Hydrate of barium*, and also *hydrate of calcium*, produce a yellowish-green

precipitate, which becomes brown when deprived of moisture. No precipitates are produced by *chloride of platinum*, *nitrate of silver*, or the reagents for alkaloids, except very slight ones with *iodohydrargyrate* and *trinitrophenic acid*. *Carbonic acid* does not redden the colorless or green modification; but though possessing the property esteemed in cochineal, it has not proved practically useful in the author's hands as an indicator in alkalimetry. It *reacts acid* to test-paper. An ultimate analysis made of the lead salt corresponds to the formula $Pb_2C_{21}H_{29}O_{30}$ (O = 16). This was made by Dr. Senier, the author's brother.

The absorption action of the solution of the coloring-matter was examined by a two-prism spectroscope. The solution used was made by decomposing about half a gram of the lead salt, suspended in rectified spirit, with sulphuric acid until, upon gently warming for some time, only a small quantity of undecomposed salt remained.

FIGS. 38, 39, 40.



It was then filtered, and diluted with spirit to about six ounces. Through a stratum of about half an inch of this solution, previously treated with reagents, light was passed. The stratum was then diluted with rectified spirit until the bands became distinct, one part of solution to three of spirit being about the proportion required. The most interesting spectra are illustrated in Figs. 38, 39, and 40. Fig. 38 represents the absorption spectrum of the so-

lution rendered acid by sulphuric acid, Fig. 39 that of the solution made alkaline by ammonia, and Fig. 40 the spectrum of the solution treated with stannic chloride. Ph. J. Trans., Feb. 10th, 1877, p. 650.

Prunus Sp.?—According to W. Dymock these drugs, evidently belonging to the cherry tribe, and called respectively "Hub-ul-Kilkil," "Gavala," and "Pudma Kasta," are imported into Bombay from Northern India, or from Arabia or Persia.

Hub-ul-Kilkil resembles ordinary cherry-stones; the almond has a brown skin and a strong prussic acid flavor.

Gavala consists of the almonds of some kind of cherry, amongst which a few entire stones are found; these have very fragile shells, of a pointed oval shape, about four-tenths of an inch long and two-tenths broad; the almonds are of a pale buff color, the skin thin, and marked with longitudinal veins; they have a strong prussic acid flavor.

Pudma Kasta consists of the smaller branches of a third kind of cherry, three-quarters of an inch, or less, in diameter; the bark evidently contains amygdalin.

All three are commonly met with in the Bombay shops, and serve as substitutes for prussic acid in native practice. Ph. J. Trans., Jan. 6th, 1877, p. 549.

Cherry and Plum Seeds, Utilization of Fixed Oil.—Guyot recommends the preparation by expression of the fixed oils which are contained in the seeds of the cherry and the yellow plum (*mirabelle*), particularly in those districts where the liquor known as *kirschenwasser* is manufactured. He obtained, by extraction with ether, 6.4 per cent. of oil from the former, and 10.7 per cent. from the latter seeds. The cherry oil is limpid, golden-yellow, and has a decided almond odor, which disappears on exposure after some time. The plum oil is similar, but darker yellow, and of a stronger almond odor. A. J. Ph., 1877, p. 190; Rép. de Ph., 1876, p. 678.

LEGUMINOSÆ.

Balsam of Tolu, Constituents.—It has long been a disputed point whether balsam of tolu contains only cinnamic acid, or a mixture of this with benzoic acid. The presence of the latter has been denied by Frémy, and although Deville afterwards obtained benzoic acid from the balsam, yet, according to Kopp, this did not

pre-exist therein, but was produced during the process of extraction. The latest researches of Carles likewise seem to prove the absence of benzoic acid.

The question has been again taken up by E. Busse, who attributes the conflicting results to the fact that the various investigators employed methods which caused chemical changes in the pre-existing constituents. He employed the method pursued by Kraut in his examination of balsam of Peru, by which such decompositions are avoided as much as possible. One kilogram of strongly resinified balsam of tolu was dissolved in 2 litres of ether, the solution filtered from the trifling residue and shaken for some time with 2 litres of soda solution, containing 100 grams of anhydrous soda. The decanted ether was repeatedly washed with fresh soda solution, and finally with water, until all alkalinity disappeared. The clear ethereal liquid was deprived of its ether by distillation in the water-bath, when it left behind 85 grams of a neutral liquid which was subjected to fractional distillation. During this process three separate portions distilled over, part at near 200° C. (= 392° F.), another at 250° to 300° C. (= 482° to 572° F.), and most at over 300° C. (= 572° F.), which latter separates on standing, a crystalline mass, exhibiting, after purification, the melting-point of cinnamic acid. In order to remove this product, which had probably formed by the action of heat and water, the several distillates were once more dissolved in ether, deprived of acid by shaking with solution of soda, washed, and after removal of the ether, dehydrated with chloride of calcium. Each product was then again rectified and immediately analyzed. The first distillate yielded figures which led to no certain formula, but the reaction seemed to indicate that it consisted of impure benzyl alcohol. The second distillate, which boiled at 300° C. (= 572° F.), yielded the formula $C_{14}H_{12}O_2$, corresponding to benzoate of benzylic ether, and after treatment with potassa and addition of sulphuric acid, yielded an acid having the melting-point of 121° C. (= 249.8° F.), and proving to be undoubtedly *benzoic acid*. The third distillate, boiling at over 320° C. (= 608° F.), yielded the formula $C_{16}H_{14}O_2$, corresponding to cinnamate of benzylic ether. By decomposition this yielded an acid melting at 133° C. (= 271.4° F.), and proving to be *cinnamic acid*. From the alkaline residue remaining in the above process, both cinnamic and benzoic acid were also obtained. The results prove that balsam of tolu contains the same constituents as balsam of Peru, but in smaller quantities and in different proportions, cinna-

mic acid predominating in the former and benzoic acid in the latter. It contains cinnamic and benzoic acids, neutral benzoate and cinnamate of benzylic ether, and a peculiar resin, which, however, requires further investigation. New Rem., Sept. 1876, p. 264, from Ber. Chem. Gaz.

Spartium Junceum.—According to Prof. Landerer, the fibres of this plant furnish material for excellent fabrics. By the women of Maina and Sparta they are principally made into carpets, which, when properly kept, are almost indestructible, and will last twenty or thirty years. These textiles, fine specimens of which were exhibited at the late Olympian Exhibition at Athens, are called *spartopana.* The same material was formerly used for preparing many articles of domestic use. The plant has always been esteemed for bees; it has been employed medicinally for its diuretic and drastic properties. A. J. Ph., April, 1877, p. 157.

Psoralia Corylifolia.—The seeds of this plant, locally known in Bombay by the name of "Bawachs," are described in Moodeen Sheeriff's appendix to the Pharmacopœia of India. W. Dymock states that the oil expressed from them has been a good deal used in Bombay as an alterative in leprosy, and, it is said, with very favorable results. The seeds contain no alkaloid or glucoside, but a large quantity of oil and resin. Ph. J. Trans., Oct. 28th, 1876, p. 350.

Clitorea Ternata.—The root and seeds of this plant, locally known in India by the name of "Kajalee," are described by W. Dymock. The root is large, fleshy, branched, and spreading, often an inch or more in diameter, white, with an acrid, bitter taste; the root-bark is soft, and thick, and easily separated. Under the microscope it is seen to consist of a thin-walled cellular tissue, containing a little granular matter, and here and there a few starch-cells. The central portion of the root is composed of very large dotted vessels, easily visible with the naked eye. The seeds are rather more than $\frac{2}{8}$ of an inch long and resemble vetch seeds; they are mottled green and black. The testa is hard and contains two cotyledons, made up of elongated thin-walled cells, full of large starch-granules; they have an acrid, bitter taste. The seeds exhausted with spirit yield a light-brown resin, with an odor exactly like jalap. The medicinal uses of both root and seeds are noticed in the Indian Pharmacopœia and its supplement by Moodeen

Sheeriff. Mr. Dymock suggests a trial of the resin. Ph. J. Trans., Sept. 2d, 1877, p. 190.

Extract of Liquorice.—E. Rennard has examined a sample of extract of liquorice from Asia Minor which, in its composition and character, corresponded exactly to the new variety of so-called Italian liquorice recently examined by Peltz. It contained 76.5 per cent. of soluble extract, 12.0 per cent. of insoluble residue, and 11.5 per cent. of moisture. The quantity of glycyrrhizin was found to be 15.8 per cent.; of starch, 3.3 per cent. These figures differ only from those of the so-called Italian variety in the quantity of water, and the author is therefore of the opinion that both are derived from the same source, *i. e.*, Asia Minor. The large amount of soluble extract in this variety fit it particularly for the preparation of succ. liquir. depur. Ph. Zeitschr. f. Russ., No. 20, 1876, p. 615.

Agati Grandiflora.—The tree, though not a native, is very common in India, and is locally known by the name of "Agasta." W. Dymock describes the bark and a gum accumulating in its fissures, both of which are intensely astringent, and the latter also bitter. The leaves also have an astringent taste, but neither the bark, gum, nor leaves appear to be used medicinally in Bombay, while the juice of the flowers is a popular remedy in nasal catarrh, being blown up the nostrils, and causing a very copious discharge. The bark is much fissured longitudinally, of a grayish-brown externally, the dry portion nearly equal to the living in thickness; in the fissures may be seen numerous small tears of the gum, of a garnet color when fresh, but soon becoming almost black. The suberous layer of the living bark is of a reddish color, from a deposit of the same kind of gum in the cells. In the vascular zones of the bark are larger lactiferous vessels which are filled with the gum in a fluid state, and of a pale color. The dry suber already mentioned is loaded with small deposits of gum. This is partially soluble in spirit, and also in water, leaving a gelatinous residue of small bulk. Ph. J. Trans., Aug. 26th, 1876, p. 171.

Moringa Pterygosperma, Local Name in India "Shegua."—The root of this tree is, according to W. Dymock, universally accepted in the Bombay Presidency as a substitute for horseradish. The oil of the seeds is not expressed, the pods being always gathered in an unripe state for use as a vegetable; they may be boiled and served with melted butter, or cut in pieces and eaten with curries. The

flowers are eaten with curries, and also fried with butter. The leaves boiled with onions and spices are used in the same manner. A decoction of the bark is used as a fomentation to relieve spasmodic pains arising from various causes. The gum, when it first exudes, is opaque and white; from exposure to the sun it becomes pink, and finally of a dull red color on the surface, the interior remaining white. It occurs in pieces of considerable size, and generally more or less vermicular in form. Placed in water it swells up and forms a salmon-colored, firm, bulky jelly. The taste is mild astringent. Shegua gum is said to be used to produce abortion, but it is difficult to obtain any reliable evidence upon a point of this nature; it would be quite possible to use it as a tent to dilate the os uteri, as it is very tough, and swells rapidly when moistened. Ph. J. Trans., Dec. 16th, 1876, p. 491.

Cassia Alata.—The leaflets of this plant, locally called "Dadmurdun," are used in East Indian pharmacy. They are obovate-oblong, obtuse, mucronate, and glabrous on both sides, and taste like senna, but less nauseous. The shrub, in the neighborhood of Bombay, is only found in gardens. The bark of

Cassia auriculata is found in the Bombay shops generally in small strips or quills about as thick as cinnamon, nearly smooth, externally reddish-brown, internally olive-green. Its taste is sweetish, and moderately astringent. Sections examined under the microscope show a deposit of crystals arranged like rows of beads in the course of the vessels. It is known under the name of "Turwar," or "Awul." The small flat heart-shaped seeds are administered by the native doctors as a cooling medicine. W. Dymock, in Ph. J. Trans., June 2d, 1872, p. 977.

Cassia Tora.—This plant, the local name of which is "Takla," is, according to W. Dymock, a common annual weed in cultivated grounds about Bombay, and is described by him as follows: Leaflets, three pairs; obovate, obtuse, glabrous, the terminal pair being much the largest, all folding up closely at night. Flowers axillary, generally in pairs, dull yellow. Legumes about six inches long, narrow, quadrangular, about one-eighth of an inch in diameter, containing numerous elongated seeds. The whole plant has a fetid smell. In good soil it attains a height of about three feet. The leaves are mucilaginous, and have a nauseous taste; they are generally used as a remedy for the so-called Indian ringworm, and as

a poultice to boils, etc., and also possess purgative properties. Ph. J. Trans., Oct. 28th, 1876, p. 350.

Acacia Arabica.—The local name of the tree in India is, according to W. Dymock, "Babul." It yields gum in great abundance in March and April. Much of it is of a bright-red color, and translucent; sometimes it is almost colorless; very large masses are met with. Although it is entirely soluble in cold water, and tastes like gum arabic, it is of little value as a gum, as it forms a very weak mucilage; the color is also objectionable. Ph. J. Trans., Aug. 26th, 1876, p. 172.

Gums of Senegal.—Dr. A. Corre, after enumerating the varieties and forms in which the gums of Senegal are met with in commerce, gives some interesting speculative information on the mode in which these gums are produced.

The Senegal gums are collected from a great variety of plants. The acacias (*nilotica*, *verek*, *Adansonii*, *albida*, *dealbata*, *Sing*, *Seyal*, etc.) yield the greater part and the finest qualities. They are also obtained from the *Khaya senegalensis*, certain *Spondias*, some *Sterculiaceæ*, and perhaps *Bassia*, etc. As the result of the study of the mode in which the gum is produced from verek, the author is of opinion that the starting-point is certainly in the cambium. When a transverse incision is made in a young branch, there is observed at first a sort of exudation, badly defined, between the wood and the bark. As the exudation becomes more considerable it raises the bark, and makes its way to the exterior through any cracks or fissures. But as there are two layers in this zone,—a ligneous and a cellular layer,—the question arises, in which layer does the gum take its origin? For the following reasons the author believes it to be formed in the ligneous layer at the expense of the crude sap circulating therein:

1. Upon different specimens of verek he has observed that at the base of the gummy exudations the exterior woody bundles become deviated in the form of a capsule, and present traces of erosive or destructive action. In very young branches, by the aid of a microscope, these bundles may be distinguished, dissociated and jagged, in the midst of the gummy matter.

2. The balls of gum are frequently marked with very regular cavities, similar to those produced in a viscous mass by blowing air into it through a slender tube. These cavities cannot be due to the penetration of a gas coming directly from without, for they

face inward, *i. e.*, towards the base of the exudations; they could only be produced by the air from the vessels of the sap-wood, ruptured and dissociated at the same time as the woody fibres.

3. The mineral elements of gum (lime, etc.) belong to the crude sap.

Gum, however, is not simply water charged with salts, neither is it a highly concentrated saline solution. It is a product that presents great analogy of chemical composition with lignose. The author, therefore, considers gum to be the result of a kind of liquefaction of the elements of the sap-wood by the crude sap. It is incontestable that the formation of gum is connected with an anomalous state due to excess of nutrition. It is observed more particularly at the points of budding and at the bifurcation of the branches, and it acquires a remarkable development upon abnormal nodosities—in fact, wherever the nutritive action exists in the greatest intensity. Beyond certain limits this energy in the rising of the sap is accompanied by a slackening of the circulation, which leads to a stagnation of the liquid through the engorgement of the channels; hence, perhaps, by absorption, leading to the softening and liquefaction of the fibrous and vascular element of the sap-wood. In this phenomenon the easterly winds have a share, their high temperature and dryness favoring the determination of the sap to the exterior. Their influence is not, as often stated, limited to the production of cracks in the bark.

Recently an important part in the production of the Senegal gums has been attributed to a loranthaceous parasite, which is met with frequently in Eastern Africa, not only on gum trees, but also on guava trees, palms, etc. The author has never observed the least exudation of gum at the points of implantation of this parasite, which itself takes up sap and leaves no excess for the plant on which it is developed. The nodosities, which have probably been attributed to the action of this parasite, and thus led to the suggestion, are considered to be the results of insect punctures. Ph. J. Trans., Oct. 21st, 1876, p. 330; Jour. de Pharm. (4), xxiv, p. 318.

Acacia Catechu.—The local name of the plant, in India, is *Kheir*, and it furnishes, according to W. Dymock, the drug named *keersal*, which consists of impure catechuic acids obtained from cavities in the wood, and occurs in small irregular fragments, like little bits of very pale catechu mixed with chips of reddish wood, the fragments often adhering closely to the wood. This drug is collected by men who split firewood, and fetches a high price, as it is only

occasionally met with; it has a sweetish, very feebly astringent taste, and under the microscope is seen to be composed of minute needle-shaped crystals. When placed in water the coloring-matter of the particles of wood mixed with the drug communicates a red color to it. Keersal is soluble in boiling water, but is thrown down in conglomerate masses of small needle-shaped crystals upon the water cooling; it is also soluble in rectified spirit and is deposited in the same form on the spirit evaporating. In native practice it is valued as a remedy in chest affections, and is thought to promote expectoration. Ph. J. Trans., Aug. 5th, 1876, p. 109.

The Genus Copaifera.—In the preparation of the botanical portion of an article to appear under the word "Copaiva," in the "Dictionaire Encyclopédique des Sciences Médicale," Prof. H. Baillon has had to undertake some researches upon the principal sources of that drug, and these have given rise to an article which he has communicated to "Jour. de Ph. et de Chim." (vol. xxv, p. 251). From the translation in "Ph. J. Trans." (April 28th, 1877, p. 873), the following is extracted: It is not very long since it was believed that all the copaiva of commerce was produced by the *Copaifera officinalis*, a species of which the geographical distribution has been much too extended in classic works, and which grows spontaneously only in Trinidad, Venezuela, Colombia, and in the northwestern part of South America, starting from San Salvador. It is cultivated in several tropical countries in both hemispheres, notably at Martinique, and it sometimes attains a rather fine development in hothouses, where it occasionally flowers. This species is the *Copaiva* of Jacquin. Its juice is the *Tacamahaca* of Venezuela, the *Aceite de Canime* of New Granada, the *Capivi*, *Cupayba*, and *Copaiba* of the natives. In the old English pharmacopœias it is called *Balsamum copaivi*. Under the name of *Copaifera officinalis*, it is believed that Linnæus confounded several species. Desfontaine also has reserved the name *C. Jacquini* for the plant of the Antilles, Colombia, and Venezuela, the one for which Kunth and Humboldt have preserved the name *C. officinalis*. But besides this, numerous other species of *Copaifera* appear to yield the oleo-resin of copaiba. *C. pubiflora*, Benth., a species found first in British Guiana, is used for the extraction of the balsam. It appears to be very near to *C. officinalis* in its character, but Bentham, in his more recent works, considers it to be only a form or variety, with pubescent flowers and more acute leaves, of *C. Martii*, Hayne. Bentham has given the name *C. rigida* to a

Brazilian species from the provinces of Pianhy and Goyaz, which is used for the extraction of the oleo-resin, and has thick coriaceous leaves. The *C. Martii* is a species from Northern Brazil; it has been found at Cujuba, in the province of Mato Grosso, at Pará, near the Amazon, and at Maraca de Santarem. It grows also in British Guiana, where it is worked for the extraction of copaiba. *Copaifera Langsdorffii*, Desf., is the species best known of those that yield the copaiva of Brazil. It is the *C. nitida* of Hayne, and the *C. Sellowii*. Bentham believes that it is also the *C. Jussieui* of Hayne; but that plant has not been examined by him, neither is it to be found in Jussieu's herbarium. Numerous varieties of this species have been distinguished, under such names as *grandiflora*, *laxa*, and *glabra*. The last two are made species by some authors: the one is *C. laxa*, of Hayne, and the other the *C. glabra*, of Vogel. *Copaifera Guianensis*, Desf., has long been considered as furnishing all the copaiba which comes to Europe by Cayenne. It grows in all the Guianas, and also in the north of Brazil, where Spruce met with it between Manaos and Barcellos. The species is rather near to *C. officinalis*, but it has shorter and more acuminate leaflets. Bentham considers that the *C. bijuga* of Hayne should be referred to this species. *C. oblongifolia*, Mart., is a Brazilian species, met with in the provinces of Goyaz and Minas Geraes, especially in the plain near Chapado de Parana, and towards the banks of the Rio Claro. This species being most frequently represented by individuals with slender trunks, which can hardly be worked profitably, the author considers it at least doubtful whether it furnishes copaiba. *C. multijuga*, Hayne, is but doubtfully referred to this genus by Bentham. Baillon believes that he saw the plant some years since in the Imperial Herbarium at Vienna, and that it seemed to approach by its foliage more nearly to the genus *Dialium* than *Copaifera*. Probably the oleo-resin of copaiba was not originally extracted from the *Copaiferæ* of Central America, but from Brazilian species, and from *C. Langsdorffii*. It is, therefore, very possible that this was the principal one to which Linnæus attributed the name *C. officinalis*. In fact, one of the earliest documents known in Europe on this question, as noticed by Hanbury, was a treatise by a Portuguese priest, who lived in Brazil from 1570 to 1600. His manuscript was translated into English, and published in 1625, by Purchas ("Pilgrims and Pilgrimages," iv, 1308). Among many other natural products of the country, the author notices the "*Cupayba*" as a large tree,

from the trunk of which, when deeply incised, there ran in abundance a clear oil, much esteemed in medicine.

The name copaiva is wrongly given to an oleaginous liquid, extracted by incising the trunk of the *Dipterocarpus* and other trees of the same family, in the Indian Archipelago. Its properties are nearly the same, but from a botanical point of view there is no relation between the plants of the two groups. In India, also, the juice of a plant very near to the *Copaiferæ* in its organization, the *Hardwickia pinnata*, Roxb., is used like true copaiva.

Their are some *Copaiferæ* in Africa, where they are called "*Gorskia*," but the author is not aware whether they are used medicinally.

Copaiva, New Method of Detecting Adulteration with Castor Oil.—Dr. Muter proposes the following method for the detection of castor oil in copaiva, which is based upon the ready solubility of copaviate of sodium in a mixture of 5 parts by volume of ether, and 1 part of absolute alcohol: 3 to 4 grams of the sample are weighed into a clean dry flask, and saponified on the water-bath with 50 c.c. of alcohol, and a lump of caustic soda weighing not less than 5 grams. When all is distilled, water is added, and the whole is washed into a half-pint basin so as to nearly fill it, and evaporated to 100 c.c. over a low gas-flame. Dilute sulphuric acid is then added till the whole just becomes permanently turbid, and then solution of caustic soda is dropped in till it *just clears again*. By this means a solution is obtained with the least possible excess of alkali, and with a good amount of sulphate of sodium. The whole is now evaporated to *perfect dryness* on a water-bath, which is best accomplished by moistening the apparently dry residue with a few drops of absolute alcohol, and again drying, and stirring towards the end, so that the sulphate may mix with the soaps, and produce an easily pulverulent residue. The residue is transferred to a wide-mouthed stoppered bottle, treated with 70 c.c. of the ether-alcohol, and well shaken up. As soon as it is fairly settled, the fluid is filtered off through a quick filter, and this is repeated twice successively with the same quantity of solvent. The residue in the bottle and on the filter now consist of oleate of sodium and sulphate, if the balsam is impure, and of the latter only, with a little insoluble resin soap, if the balsam is pure. The contents of the bottle and filter are dissolved in a little warm water, and after heating until all smell of the ether is gone, the whole is boiled, freely acidulated with hydrochloric acid, and set aside to cool. If, when cold, nothing but a few specks of *brown resin* should rise to the

surface, the balsam is pure; but if an oily layer is formed, it is adulterated, and the smell of the separated oleic acid will at once determine whether it is actually castor oil or not. In the case of the presence of oil, 2 grams of pure and dry white wax are added, and the whole heated till the wax melts with the oleic acid. On cooling, a solid cake is formed, which is detached from the side of the beaker, and the fluid below passed through a filter. The cake is once more melted in boiling water, cooled, detached, dried by gentle pressure on blotting-paper, dried in a platinum dish in a water oven, and weighed. With the quantities used, a correction of 0.20 for loss of oleic acid by the solvent must be added to the weight in grams obtained. Convert the result into percentage, and deduct from this six per cent. of the whole quantity of copaiva used as the possible quantity of *altered resin* naturally contained in the copaiva, and contained in the oleic acid separated. This *altered resin*, so called, varies slightly in its quantity, according to the age of the copaiva, but is sufficiently near six per cent. to warrant the allowance to be made at that figure. Ph. J. Trans., Dec. 30th, 1876, p. 534.

Copaiba, Detection of Castor Oil.—Prof. J. M. Maisch draws attention to the fallacy of Prof. Wayne's test for the presence of castor oil (see Proceedings, 1874, p. 153). This test consists in agitating the suspected copaiva with 3 volumes of petroleum benzin, when, if castor oil is present, a milky mixture is formed, quickly separating into two layers, whereas when pure, a clear solution forms. Prof. Maisch has repeatedly made this test, using equal measures of copaiva and castor oil, and uniformly obtained a clear solution. If, however, 10 volumes of benzin were used, then immediate and dense milky turbidity is produced if the castor oil is present in considerable quantity. The test must, nevertheless, be accepted with caution, for it is found that pure balsam will produce a slightly turbid mixture with 10 volumes of benzin, and samples have been found which required 6 and 15 volumes respectively to produce a turbidity; and in the latter instance an equal bulk of castor oil mixed with the copaiva did not increase the turbidity to any marked extent. A. J. Ph., March, 1877, p. 131.

Erythrophlœum Guineense, Alkaloid in the Bark.—E. Hardy and N. Gallois have found in the bark, the mancone of the Portuguese, a crystalline alkaloid which they have named

Erythrophleia. It is obtained by exhausting the bark with alco-

hol acidulated with muriatic acid, evaporating, dissolving residue in water, and decomposing with ammonia in presence of acetic ether. Erythrophleia is crystalline, sparingly soluble in ether and chloroform, but readily in acetic acid. Physiologically it acts as a muscular poison, acting primarily on the heart. The bark of *E. couminga* contains an alkaloid having a similar physiological action. A. J. Ph., Dec. 1876, p. 539; Chem. Centrbl., No. 40, 1876; Bull. Soc. Chim.

The alkaloid is soluble in water, amylic alcohol, and ordinary alcohol, and it forms salts with acids. A. J. Ph., Jan. 1877, p. 32.

TEREBINTHACEÆ.

Mangifera Indica.—W. Dymock describes the gum of this plant, locally called "Amba," as it occurs in the Bombay shops. Mango gum occurs in irregular shaped pieces, some of them stalactiform and shining; it is black and easily broken; the fractured surface is dull, the odor faint and gummy; it is entirely soluble in cold water, forming a solution of the color of tincture of iodine and very slightly viscid. A resinous exudation occurs upon the fruit of this tree having the color and odor of turpentine. Neither of these substances appear to have medicinal value. Ph. J. Trans., Dec. 2d, 1876, p. 451.

Rhus Toxicodendron, Remedy against its Poisonous Effects.—E. H. Bernard writes to the "Louisville Medical News," that painting over the inflamed surface with *fluid extract of Gelsemium sempervirens* gives complete relief in poisoning by Rhus toxicodendron. New Rem., Sept. 1876, p. 269.

Since the publication of the above Dr. Lawrence Johnson, of New York, has had occasion to use the new remedy on his own person, but found it to be utterly valueless, even after persistent use, either to relieve the itching and pain, or to reduce the inflammation resulting from rhus poisoning. Ibid., Oct. 1876, p. 305.

Boswellia Serrata.—W. Dymock has had opportunity to examine specimens of this tree, known in India by the name of "Khandesh," and of its product, a gum-resin, locally called "Gugal." The latter corresponds exactly with the gugal of commerce, viz., irregular lumps, covered more or less with dirt and hair, to which portions of papery bark as well as the thick inner bark sometimes adhere; of a greenish-yellow color, with an occasional tinge of red; consistence waxy; odor peculiar and balsamic; taste bitter

and balsamic. Gugal forms a grayish-white emulsion with water; it is used as an incense principally, and has on this account probably been confounded with olibanum. In the Indian Pharmacopœia and other works it appears to have been confounded with Indian bdellium, or as it is sometimes called Bysabol Gugal. This has a peculiar mushroom odor, and is in appearance much like African bdellium, but is the product of a Balsamodendron. Ph. J. Trans., Sept. 2d, 1876, p. 190.

Balsamodendron Roxburghii.—Through the kindness of Mr. Woodrow, in charge of the Botanical Gardens at Hewra, in the Deccan, Prof. W. Dymock, of Bombay, has been favored with fresh specimens of the stem and exudation of this tree, collected near Prit, about thirty miles north of Poonah. The epidermis of the stem consists of several rows of delicate elongated cells containing a little granular matter; the cells beneath this, which form the green bark, are loaded with chlorophyll and starch. Proceeding inwardly the chlorophyll gradually diminishes, and a few bundles of liber cells are met with, forming a broken irregular zone. Within this the cells contain granular matter, starch, and globules of balsam; the cells throughout the bark are of an oblong form; laticiferous ducts permeate the bark at intervals, and the medullary rays are distinctly traceable; a few conglomerate crystals are met with. The wood, which is white, soft, and brittle, consists of elongated thin-walled cells, divided into zones; in the zone next the bark the cells (eighteen to twenty rows) are empty or contain little starch; in the next they are smaller and loaded with large starch-granules. The same structure is continued to the central pith, which consists of similar cells full of starch. The exudation of this tree is at first opaque and milky; as it dries it becomes greenish and translucent, and very closely resembles a gum-resin which the author had received from Sind as the produce of *B. Mukul*, differing from this only in that it has a more terebinthinate odor. He identifies it as forming part of the Bysabol Googul of the Bombay shops, which, in a paper on "Myrrh and its allied Gum-resins," he had described as Indian bdellium (see Proc., 1876, p. 107). He thinks it quite possible that the same tree in Arabia may produce genuine bdellium. Ph. J. Trans., Oct. 14th, 1876, p. 310.

Balsamodendron Sp.?—An article of Persian myrrh has recently been received in Bombay which, according to W. Dymock, occurs in very large masses, the contents of a bale often adhering to-

gether. It is of a rich reddish-brown color, and much of it is translucent; very oily; in taste and odor resembling African myrrh; pieces of papery bark are found adhering to it. The author has not been able to ascertain its source, but it is imported from the Persian Gulf ports, and consigned to merchants who deal in Persian goods. None of it appears as yet to have been sent to England. It readily forms an emulsion with water, and appears to have all the medicinal properties of commercial myrrh. Ph. J. Trans., Dec. 10th, 1876, p. 491.

Odina Wodier.—W. Dymock describes the odina gum, locally known as "Shimptee," or "Mooi cha goud," of Indian commerce. This gum is partly in tears of a yellowish tinge, and partly in colorless, angular fragments, which are full of fissures like gum arabic; it has a disagreeable taste, and is not astringent; about one-half of it is completely soluble in water, the remaining portion forms a slimy mucilage, but is not gelatinous. The soluble portion, which is feebly acid, is precipitated by alcohol, and in a less degree by oxalate of ammonium—not at all by perchloride of iron or borax. It is mentioned in the Pharmacopœia of India, but has probably no medicinal value. Ph. J. Trans., July 1st, 1876, p. 3.

RHAMNACEÆ.

Rhamnus Frangula.—From experiments made by Dr. Lamm, of Stockholm, it would appear that the fresh bark of Rhamnus frangula is not as active as that which is several years old; a sample of fresh bark requiring double or treble the usual dose of an old bark. This may account for the disuse into which the bark has occasionally fallen. Friedstedt mentions that the recent bark produces colic and vomiting, and the last edition of the Norwegian Pharmacopœia requires the bark to be kept for one year before it is used medicinally. A. J. Ph., July, 1876, p. 319, from Zeitschr. Œst. Ap. Ver., 1876.

CELASTRINEÆ.

Celastrus Paniculata, Local Indian Name "Malkungeé."—According to W. Dymock, the expressed oil of the seeds of this plant is of a reddish-yellow color, and deposits a quantity of solid fat after it has been kept a short time; the odor is pungent and acrid; sp. gr. 0.951. Treated with sulphuric acid, it turns of a dark bistre color. This oil is used as a stimulant application to relieve local

pain in rheumatism and fever. The crushed seeds are also used for the same purpose; they are generally combined with aromatics, such as the seeds of *Barringtonia* and *Ptychotis ajowan*. Internally, the seeds are sometimes administered as a stimulant and aphrodisiac, commencing with a dose of one seed, to be gradually increased to fifty, by daily increments of one. Ph. J. Trans., Dec. 16th, 1876, p. 491.

Ilex Maté Paraguayensis, Maté, or Paraguayan Tea.—The "Revista Farmaceutica," the organ of the Argentine Pharmaceutical Society, quotes some interesting paragraphs on maté, from an unpublished work by Dr. Bialet. The Paraguay tea tree is a small tree belonging to the family of the Celastrineæ (not to the Ilicieæ, as stated by some authors), which reaches at the most a height of seven metres; ordinarily it does not exceed four or five. Its trunk is almost twenty centimetres in circumference, and is covered by a whitish bark. The leaves are oblong, cuneiform, obtuse, and finely dentate. It has axillary multipartite peduncles; calyx tetrasepalous; corolla, four petals in form of a crown; stile none; stigma 4-fid; fruit, a four-seeded berry. The plant grows very abundantly in Paraguay, North Corrientes, Chaco, and South Brazil, where it forms woods called "*yerbales.*"

The method of preparing maté in Paraguay is, according to Dr. Montegazza, as follows: The entire trees are cut down, and the small branches and shoots are taken with the leaves and placed in the *tatacúa*, a plot of earth about six feet square, surrounded by a fire, where the plant undergoes its first roasting. From thence it is taken to the *barbacúa*, which is a grating supported by a stone arch, underneath which burns a large fire; here it is submitted to a particular torrefaction, determined by experience, which develops the aromatic principle. Then it is reduced to a coarse powder in mortars formed of pits dug in the earth, and well rammed. It is next put into fresh bullock skins, well pressed, and placed in the sun to dry. The packages, tercois, thus obtained are very compact, weigh from 90 to 100 kilos, and have an average value in commerce of one to two dollars per kilo, according to quality; those of Paraguay and the Missiones being the better, or least hurtful, whilst those of Oran and Paranaguá are much more prejudicial to health.

Of all the analyses of maté that have appeared in books, Dr. Bialet considers not one, up to the present time, deserves much credit. Senor Arata, however, who has devoted much time and skill to the subject, has placed the following data at his service:

Maté yields from 100 parts, 8.315 per cent. of ash, composed of 12.344 CaO, 11.395 MgO, 7.281 NaO, 2.984 KO, 2.500 MnO, 3.410 Fe_2O_3, 0.926 SO_3, 0.716 HCl, 5.540 PO_5, 8.150 CO_2, and 44.754 per cent. of sand, silica, carbon, and loss. The large amount of sand found is introduced by the mode of preparation, in excavations made in the soil.

The plant (the prepared maté?—Rep.) yields to ether 9.820 per cent., then to alcohol 8.432 per cent., then to water 26.208 per cent., then to water acidulated with hydrochloric acid 7.260 per cent., then to solution of caustic soda 16.880 per cent., and contains 13.280 per cent. of cellulose, 9.000 per cent. of water, and 9.120 per cent. of sand. Among the soluble principles an average of 1.300 per cent. of *caffeia* is found. The quantity, however, varies very much, being largest in the Paraguay and Missiones plants, and smallest in the Paranagná and Argentine. *Caffeic acid* and *caffeates*, which some claim to have found in maté, were searched for but not found. The *tannic acid* of maté is peculiar; it does not tan hides, and requires a special method for its estimation; the average amount obtained by the ordinary method is not more than 12 per cent., but the whole quantity present amounts to about 16 per cent. Besides these substances, maté contains a peculiar *fatty matter*, not entirely saponifiable by caustic potash, and some *pectic matter*.

In its caffeic strength it ranks between coffee and tea, and like these acts upon the nervous system; but though it contains a large quantity of caffeia, it does not exalt the peripheric nerve like tea, nor the cerebric like coffee, but rather contributes in a high degree to the indolence and drowsiness of the ordinary drinkers of maté, whose mental faculties become at length disarranged and impoverished to a lamentable degree. The moderate use of two or three doses a day during the summer heats or great fatigue is not hurtful, but it should be taken in a cup, and not sucked through the "*bomlilla*," as seems to be the usual way of taking it. Ph. J. Trans., July 1st, 1876, p. 4.

PIPERACEÆ.

Piper Methysticum, Miq.; Ava, or Kava-Kava.—The root, under the name of Kava-Kava, has lately attracted some attention in France as a remedy for gonorrhœa. The plant, which is cultivated in Viti, Tahiti, Hawaii, the Society and Tongan Islands, has been known since the time of Captain Cook, and has been fully described

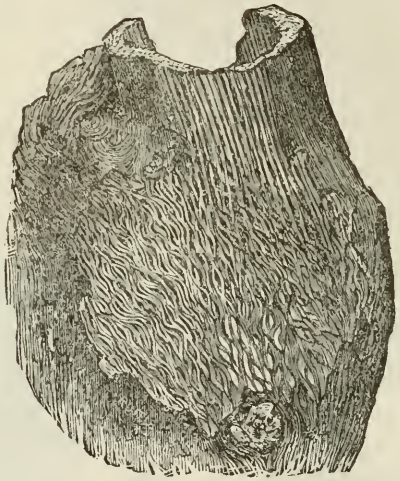
by Mr. Morson as far back as 1844. This description, together with an excellent cut (Fig. 41) of the plant, is now reproduced in Ph.

Fig. 41.

J. Trans., Aug. 19th, 1876, p. 149, together with much additional information relating to the root. This is large and fibrous, but

rather light and spongy in texture. When fresh, it is said to weigh from two to four pounds, although it sometimes attains as much as twenty pounds, or even more, in weight. On drying, it loses rather more than half its weight. It is externally of a grayish-brown color, and has a very thin bark, which, when sliced off, shows a complete network of woody tissue (Fig. 42), some of the interstices of which

Fig. 42.



are filled with soft yellowish-white cellular matter, whilst others are quite empty. Internally, the root is of a yellowish-white color. A transverse section (Fig. 43) shows a number of narrow lines (woody bundles) radiating from near the centre to the circumference, the portions of the soft cellular tissue by which the lines are separated from each other being much wider than the lines themselves. The central portion of the root is soft and cellular, with a few woody bundles anastomosing with each other, and proceeding at right angles to the radiating bundles, so that they form a network in the centre of the transverse section. The root has a pleasant odor, recalling that of the lilac or meadow sweet, is slightly pungent, causing an increase in the flow of the saliva, produces a slightly astringent sensation, and is scarcely bitter. The root and extreme base of the stem are the parts generally used; the form for medicinal purposes being an infusion made by macerating about one drachm of the scraped root in a quart of water for five minutes. According to Cuzent, the root contains a pale yellow essential oil,

2 per cent. of acid resin, and about 1 per cent. of a neutral crystalline principle, *Kavahin* or *Methysticin*, which deposits in acicular crystals from a concentrated tincture. The medicinal properties

Fig. 43.

are neither due to Kavahin or to the resin, and further investigation of the chemical characters of the root is therefore required.

Piper Citrifolium (called Jaborandi in the province of Rio de Janeiro), see "Rutaceæ."

EUPHORBIACEÆ.

Briedelia Montana.—A short thick tree with spreading branches, known in India, according to W. Dymock, under the name of "Asauna." The bark, which is well known as a valuable astringent in the Bombay Presidency, is externally of a light-brown color, and has little fungous protuberances of dead suber; internally it is smooth and fibrous, and of a light-cinnamon color; taste purely astringent. If soaked in water it gives out much mucilage. The fibrous portion of the bark is very tough and strong. Sections placed under the microscope show the outer portion to be made up of thin-celled reddish parenchyma; in the inner portion there are numerous vessels, the external surface of which is incrusted with large crystals arranged in regular columns. Ph. J. Trans., Oct. 14th, 1876, p. 309.

Ricinus Communis.—E. L. Boerner has made some experiments with the mare of ricinus seeds, from which the oil had been expressed, and found it to still contain 11 per cent. of oil. This, he

thinks, can be utilized by extraction (with bisulphide of carbon ?—Rep.). Among the substances isolated from the marc was butyric acid and emulsin, the isolation of the latter confirming the results previously obtained by H. Bower ("A. J. Ph.," 1854, p. 208). He also obtained the crystallizable substance of Prof. Tuson, supposed to be an alkaloid; his experiments, however, seem to indicate that this substance is not an alkaloid. A. J. Ph., Nov. 1876, p. 481.

Jatropha Glandulifera, *Local Name in India*, "*Jungli Erendi.*"—W. Dymock describes this shrub, which is small, and remarkable for the shining reddish-brown color of its young foliage. The leaves are palmate, 3–5 cleft; panicles terminal, short, few-flowered flowers reddish-brown in the monsoon, in the dry season both flowers and leaves lose much of their red color. The young branches and petioles of the leaves are thickly studded with sticky red glandular hairs. The capsules are three-celled and three-seeded, with an outer adherent fleshy epicarp, which dries up as the fruit ripens; when this takes place, the three triangular woody cells of which it is composed, divide into six pieces suddenly with a sharp report, and the seeds are projected to a considerable distance; it is, therefore, necessary to gather the fruit before it is quite ripe, and dry it in a covered place. The seeds, including the strophiole, are three-tenths of an inch long, and two-tenths broad; they are of a gray color with two brown stripes on the dorsum, which is convex; the under side has two flat surfaces, divided by a central ridge. The kernel is without smell, and very oily, and has a nutty sweet taste. Under the microscope it is seen to consist of a delicate stroma, completely filled with small oil-cells; when these are crushed large oil-globules make their appearance. In the Bombay Presidency the juice of the plant is used as a counterirritant, to remove opacities of the cornea, or thickening of the conjunctiva, and the oil of the seeds as a stimulant embrocation in chronic rheumatism. The shrub is very common on waste grounds about Bombay, and appears to have been introduced from the Deccan. Ph. J. Trans., Dec. 16th, 1876, p. 492.

Jatropha nana, *local name* "*Kirkundi*," much resembles the above-mentioned plant, and has the same medicinal properties. Ibid.

Jatropha Curcas.—The local name of this tree in India, according to W. Dymock, is "Moghli Erendi." The young roots are soft, fleshy, and tapering, with a white-brown scaly epidermis, and

a few thin rootlets; bark yellowish-white internally, with a peculiar perfume, like tuberose, when freshly removed; wood white and very soft. On section the bark is seen to contain oil-globules, and very numerous conglomerate raphides; the vascular system appears to be full of a yellowish viscid secretion; the woody portion is loaded with starch. Jatropha root bark has an acrid taste like fresh mezereon; it is applied externally in rheumatism. The milky juice of this tree is worthy of remark; it dries into a brilliant transparent varnish, of the color and consistence of shellac, and is used by the country people like collodion, to close cuts or wounds. Ph. J. Trans., March 10th, 1877, p. 730.

Manihot Utilissima, Cultivation in Brazil.—Acting Consul Austin, of Rio, reports that he has been informed by a campos planter that a square of 220 metres of land will grow 40,000 mandioca plants, which even in inferior soil will produce regularly 80,000 pounds of farina. At the lowest valuation, 60 reis per pound, this would give a revenue of £520, a result superior to that derived from sugar or cotton. The preparation of tapioca from it is easy and inexpensive. The mandioca flourishes in intertropical and temperate regions, but most luxuriantly where the soil is loose and dry, especially if it be sandy. No less than thirty varieties are grown in Brazil, and of all the crops it is the one that gives the best return and the least trouble. Ph. J. Trans., July 29th, 1876, p. 102.

Euphorbia Ipecacuanha.—Philip H. Dilg has subjected the root, collected in New Jersey, late in September, to chemical examination. He failed to isolate the emetic principle, but obtained a crystalline substance, which responded to the tests for *euphorbin* as given by Flückiger ("Pharmacographia," p. 504). The alcoholic extract, obtained by spontaneous evaporation, was of a light-brown color and contained some crystals; ether extracted from it some oil and waxy matter, and a compound, which, on evaporation from petroleum benzin, yielded clusters of radiating crystals. A caoutchouc-like substance was also found. A. J. Ph., November, 1876, p. 485.

URTICACEÆ.

Ulmus Campestris.—The female flowers of the elm, collected shortly after maturity, were subjected to chemical analysis by A. H. Church. The perfectly dry flowers yielded 8.15 per cent. ash, and 3.31 per cent. of nitrogen. Their composition is tabulated by

the author as follows: 100 parts of the dry substance equals 88.54 carbon, hydrogen and oxygen, 3.31 *nitrogen*, 2.39 *potassa*, 0.97 *phosphoric acid*, 1.34 sulphuric acid, 0.40 silica, 3.05 lime and other ash constituents. The result shows the flowers to be very rich in the three most important elements of nourishment, nitrogen, potassa, and phosphoric acid. Arch. Ph., Jan. 1877, p. 63, from Journ. of Botany.

Indian Hemp, its Active Principle.—The home of hemp is Persia and the high plateau of Northern India, whence it has gradually spread to other countries, so as to be domesticated at present everywhere. Its narcotic properties, however, are only developed fully in its native home in Asia, and in certain parts of Africa, where it is used as a narcotic stimulant and intoxicant by nearly 300,000,000 of inhabitants. A preparation called *madjoun* is sold in Algiers, which is powdered Cannabis sativa boiled with honey for a longer or shorter time, according to the desired consistence. Usually it is kept mixed with a certain portion of *Ras-el-hanout*, a spice compound containing nutmeg, cinnamon, cloves, various peppers, ginger, galangal, and Guinea grains. This mixture is also called *Kif*. The dose varies from the size of a hazelnut to that of a walnut, according to the age, sex, and tolerance of the person using it. Most eaters of hashish also smoke the dried leaves of the plant, either alone or mixed with the so-called "tobacco of the desert," which, according to Dr. Guyon, is a species of hyoscyamus.

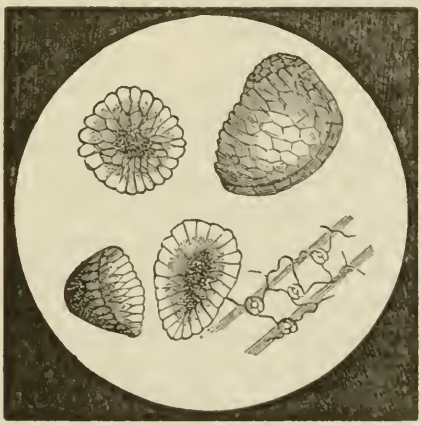
Dr. Preobraschensky, who accompanied the expedition to China in 1873, furnishes the following information on a hashish of Central Asia: This article occurs in the bazaars of large cities of Middle Asia in the form of plates or cakes of various shapes, mostly five to fifteen inches long, five to ten inches broad, and one to three inches thick. Externally they are dark brown; internally greenish or brownish, of firm consistence, very tough, and almost incapable of being broken, but easily cut into fine shavings. They are prepared as follows: The resinous juice from the fresh unripe flowertops is collected during spring, mixed with sand and water to a doughy mass, which is spread upon the surface of clay, and dried until it can be cut with a knife into plates. In a few days more the excess of water has evaporated, and the substance is ready for use. It is called *Hashish* by the Russians, *Nascha* by the natives, *Bang* and *Gunjah* by the Persians, and is exported from Bochara to China, Tashkend, Kokant (Chokand), and other places. The active principle of hashish has been supposed to be a resin. Dr.

Preobraschensky has, however, lately subjected hashish to a chemical analysis, and has found an *alkaloidal body* (not only in the commercial substance, but also in the flower-tops of hemp itself, and in the pure extract prepared from it) which was recognized to be *nicotia*. 150 grams of the herb distilled with water furnished 25.4 mgm. of nicotia; 50 grams of the herb distilled with caustic lime and potassa yielded 335.28 mgm.; 5 grams of the extract of Cannabis Indica, dissolved in alcohol and distilled, yielded a distillate containing 91.14 mgm. of nicotia; and 2 grams of the extract distilled with caustic lime and potassa yielded 63.5 mgm. of the same alkaloid. New Rem., March, 1877, p. 69, from Ph. Zeit. f. Russ.

Hops, Asserted Presence of Ferment.—The experiments of L. Pasteur, made with a view of throwing some light upon the assertion of Sace that hops contain a powerful ferment (see Proceedings, 1876, p. 203), seem to prove the total absence of any fermentive principle in hops. The presence of hops has no influence upon the fermentation of dough, and its principal office appears to be to impart to bread a peculiar bitterish taste, which may be relished by some persons. A. J. Ph., Dec. 1876, p. 540; Chem. Centralbl., 1876.

Lupulina, Microscopical Examination.—Mark W. Harrington gives the following characteristics of lupulin under the microscope:

Fig. 44.



The glands consist each of two cup-shaped membranes set edge to edge, and inclosing a mass of brownish-yellow resin. In Fig. 44

three of these cups have been separated from the corresponding ones belonging to them, one of these being seen from the side, while we look down upon the two others. The fourth has two hemispheres set together, but the hinder one does not appear plainly. The lower membrane is less conical than the upper, and is composed of flattened cells, radially arranged. Sometimes a short stalk is attached. The upper membrane is more delicate and less distinctly cellular than the lower. When fresh it is hemispherical, but as the volatile portions evaporate, this membrane contracts until it finally looks like a stem to the lower portion, the whole presenting the appearance of an umbrella, or rather a thick-stemmed toadstool. This change in shape in the gland, from nearly spherical to toadstool-like, takes place as the powder becomes old and dried, and consequently worthless. The diameter of the glands is about 75-10,000ths. Along with them are found fragments of the surface membrane (epidermis), shown in the figure, with its cells and breathing-pores, and these, as well as the hairs from the hops, should not be very abundant in good lupulin. Separate fragments of resin, with occasional crystals of the same, are also found. A. J. Ph., Aug. 1876, p. 343.

Shellac, Determination of Rosin as Adulterant.—Hager gives the following method: 5.0 of the shellac are powdered, and then boiled several times with 15.0 petroleum benzin. The united liquids are evaporated, and should not leave a residue exceeding 10 per cent. of the shellac used, any excess being attributable to rosin. Ph. Centr. H., Oct. 5th, 1876, p. 346.

CUPULIFERÆ.

Fagus Sylvatica.—A. H. Church has subjected the brown scales (*perulæ*) of the leaf-buds of the common beech, his object being to determine in how far the more valuable elements of nourishment—phosphorus, nitrogen, potassium—are shed from the tree in the form of these scales. He found them to contain 15.36 per cent. of moisture, and when dry they yielded 7.70 per cent. of ash, composed of 23.60 lime, 5.29 potassa, 4.80 magnesia, 2.89 phosphoric acid, 2.09 sulphuric acid, 5.62 silica. A portion of the lime found may be due to lime-dust adhering to the scales, as the trees from which they were collected were situated on oölithic soil. By further analysis and a calculation based on the above data, he has found for 100 parts of the dry substance: 91.71 carbon, hydrogen, and

oxygen, 0.59 *nitrogen*, 0.41 *potassa*, 0.22 *phosphoric acid*, 0.17 sulphuric acid, 0.43 silica, and 6.47 lime and other ash constituents. The nitrogen, potassa, and phosphoric acid, therefore, constitute 1.22 per cent. of the dry scales, a result which corresponds perfectly with the nature of the function of these organs in the economy of the plant and with the period of their formation. Arch. Ph., Jan. 1877, p. 62, from Jour. of Botany.

CONIFERÆ.

Taxus Baccata, Analysis of Ash.—According to H. Roth, the air-dry leaves contain 3.666 per cent. of moisture, and yield 5.405 per cent. of ash, composed as follows: 5.106 potassa, 0.283 soda, 1.347 chloride of sodium, 52.262 lime, 3.121 magnesia, 0.142 alumina, 1.276 oxide of iron, 0.283 sulphuric acid, 5.177 phosphoric acid, 3.411 silica, 26.666 carbonic acid; total, 99.074.

Cypressus Pyramidalis.—N. Harsden has published a note relative to an amorphous and a crystalline substance that he has found in this plant. The *amorphous* substance was obtained by macerating the stems in alcohol, then distilling off part of the alcohol, until all the resinous matters were precipitated, separating the liquid and further heating to drive off the alcohol. A yellowish powder was precipitated that was insoluble in water, acetic acid, and ether (the last could be used for separating it from adherent resinous matter); in alcohol it was slightly soluble. Sulphuric acid converted it into a brown substance. Ammonia dissolved it, forming a citron-yellow liquid. Its alcoholic solution was precipitated by alcoholic solution of acetate of lead.

The crystalline substance was obtained from ripe or nearly ripe fruits, by macerating the peeled fruits in alcohol and allowing the tincture to evaporate spontaneously, when the crystals were left mixed with resinous matter. This substance crystallized in beautiful prisms, which had a light emerald-green tint; treatment with animal charcoal failed to remove the color. When melted upon platinum the crystals melted and afterwards volatilized, giving off irritating vapors. The crystals were insoluble in water, but soluble in ether and in alcohol; their solution in the latter was precipitated by alcoholic solution of acetate of lead. Ph. J. Trans., Oct. 14th, 1876, p. 315; Jour. de Pharm., 1876, p. 304.

UNCLASSIFIED AND GENERAL SUBJECTS.

Coto Bark, Crystallizable Constituents.—Julius Jobst reports that the crystallizable body some months since separated by him from Bolivian coto bark and named by him "cotoin" (see Proceedings, 1876, p. 377), has since, on account of its excellent anti-diarrhœic action, been used to a considerable extent; but unfortunately the importation of the crude material has not kept pace with the demand. After a long interval a larger parcel of coto bark came into his possession, but the new bark showed marked differences in its exterior, which were manifest also in the taste and smell. Upon the extraction of the bark by the process given for cotoin, a body similar to cotoin, crystallizing in yellow flakes, was obtained, which, however, was not cotoin. It has not the biting taste of cotoin; it is much less soluble in water, alcohol, ether, ammonia, and caustic potash; concentrated sulphuric acid does not produce the characteristic reaction of cotoin, but only a yellow solution; acetate of lead causes no precipitate. Nevertheless the substance preserves the anti-diarrhœic property of cotoin, although in a slightly inferior degree (probably owing to its lesser solubility). Upon inquiry, it was established that the parcel of bark was undoubtedly genuine coto bark, and it appears therefore probable that, similar to cinchona barks, the coto barks may contain dissimilar principles. The author names the new principle *paracotoin;* he is engaged in an investigation to determine the relation between cotoin, paracotoin, and the other crystalline constituents of coto bark. Ph. J. Trans., Dec. 16th, 1876, p. 495.

Bowdichia Major, Mart.—Dr. Theodore Peckolt communicates some interesting experiments made with the wood and root-bark of this imposing tree of the Brazilian forests. The tree is variously known under the names of Subupira, Sebipira, Sebupira, and Sicopira, the two last names being conventional in the provinces of Rio and Minas Geraes. A decoction of the wood is popularly used against syphilis, while the root-bark, preferably from trees growing in the Campos district (Province of Minas Geraes), has been introduced into Brazilian medicine by Dr. de Mattos, who employed it in form of tincture, syrup, and extract, in the treatment of cutaneous affections. Besides the wood and bark, a gummy exudation formed in the spring by the sting of insects, is used popularly against diarrhœa. An analysis of this gum was published by the author in Archiv der Pharmacie, 1872, p. 37, and he now more

particularly communicates his examinations of the wood and root-bark:

The air-dried wood contains in 1000 p.: 126.520 p. moisture; 7.490 p. acid resin, soluble in ether; 10.009 p. resin, insoluble in ether and alkalies; 30.000 p. tannic acid, gum, extractive, etc.; 825.981 p. vegetable fibre.

The fresh root-bark contains in 1000 p.: 627.730 p. moisture; 19.830 p. starch; 1.830 p. albumen; 12.340 p. soft resin (*α sicopira resin*), soluble in alcohol and in ether, insoluble in alkalies; 66.433 p. brittle resin (*β sicopira resin*), soluble in alcohol and alkalies, insoluble in ether; 0.190 p. crystallized *sicopirinum*, a glucoside (see Glucosides, in this report), and probably the active principle; 8.350 p. tannic acid; 91.047 p. bitter extractive, etc.; 36.690 p. gum; 135.560 p. vegetable fibre.

The examinations were made with root-bark from trees growing in the province of Rio. The root-bark of the Campos district seems to be richer in the crystallized principle, of which the stem-bark is entirely devoid. Zeitschr. Œst. Ap. Ver., July 1st, 1876, p. 289.

Salmalia Malabarica.—W. Dymock draws attention to an astringent exudation of this tree, which furnishes the East Indian drug named "Muchurrus" or "Supari che phool." It is a red fungus-like mass, changing to dark mahogany color when old; it is brittle and flaky. The larger tears are hollow in the centre, and the cavity is of a cinnamon color and has a cellular appearance. Muchurrus is not a simple juice, but the product of diseased action, being a proliferation of the cells of the suberous tissue of the bark. Upon making a section of the diseased part, a number of small cavities are seen, which contain a semi-transparent, jelly-like substance, consisting of oblong cells with botryoidal nuclei. At the margin of the cavity the columns of healthy cells are seen breaking up, and the cells separating to join the jelly-like mass; this gradually increases in size, and finds its way to the surface to be extruded as muchurrus. Upon its first appearance it is of an opaque yellowish-white color, firm externally, semifluid internally, and there is no central cavity. The dry exudation swells up in water and communicates a red color and slight astringency to it. The author has not been able to determine the cause of the disease; traces of insects are always to be seen at the site of exudation, and incisions in the healthy bark yield nothing. The local name of the tree is "Saur." Ph. J. Trans., July 1st, 1876, p. 3.

Sizygium Jambolanum.—The bark and fruit of this East Indian plant, locally known as "Jambool," are, according to W. Dymock, excellent astringents, and the tree being very common there, can almost always be obtained. The bark is gray and fissured externally; internally it is red and fibrous; its minute structure is remarkable in having several rows of very large, pitted, oblong-oval cells, which can be seen with the naked eye. The smell is something like oak bark, and the taste very astringent. The fruit is purple, the size and shape of an olive; the fleshy portion, which is very astringent, incloses a thin, white, papery cell, containing a green-colored nut. Ph. J. Trans., Aug. 26th, 1877, p. 171.

Useful Plants of the Chinese Province of Shantung.—From a recent report on the geography and natural history of the province of Shantung, published in Hong Kong, the "Journal of the Society of Arts" extracts some interesting details, which are copied in "Ph. J. Trans.," July 8th, 1876, p. 26. The following useful plants are mentioned:

Catalpa.—A kind of Catalpa, bearing the name of the great naturalist Bunge, is very common in Shantung, and decorates the gardens of Chefoo; its wood is used for making musical instruments, chessmen, chesstables, and weighing rods.

Ailanthus.—The ailanthus, or Chinese varnish tree, is not only useful for feeding silkworms, but its roots furnish an exceedingly useful drug, for use in dysentery; this remedy, long known to the Chinese, has been experimented with successfully on Europeans during the last two years, and has proved to be one of the most powerful astringents known.

Cedrela odorata, a tree closely allied to the mahogany, also grows in Shantung; the wood is of a reddish color; the fruit is astringent, and used in cases of ophthalmia. The young shoots are described as having an onionlike taste, and they are boiled and eaten by the Chinese.

Sophora japonica, the "huai-shu," is a very common tree, and is often found of great size and age, when they take the fantastical shapes the Chinese love so much. The veneration they have for old trees is a great incitement to preserving them from destruction. They support the long branches with poles or pillars, carefully patching the holes of the trunk with bricks and mortar, and often building a little chapel or niche at the foot of the tree, gen-

erally dedicated to the "Tu-lao-ye," or god of agriculture, when not so dedicated to the tree itself, which they call lao-ye. The flowers of this tree are used in China as a yellow dye, for dyeing the silk of which the garments of the Mandarins are made. Very large quantities are thus consumed, and the tree is largely cultivated for the purpose, not only in Shantung, but also in Tokien and Honan, from whence they are sent in sacks to other parts of China. Small quantities occasionally reach Great Britain, but they have not yet become an established article of commerce.

Diospyros kaki, the Chinese persimmon, is very common in Shantung. The fruit is sometimes known as the Chinese date-plum; it is of a bright-red color, about the size of an ordinary apple, and the pulp, which somewhat resembles that of a plum, is yellowish transparent. These fruits are sometimes dried and candied; but both in their fresh and preserved states they are very delicious. Considering the ease with which they might be sent, preserved in tins or earthenware jars, it is surprising they are not often met with in the European markets. They seem to be largely exported to Chili.

Salisburia Adiantifolia.—This elegant tree, called Ginkor, or maidenhair tree, bears a fruit, the use of which appears to be confined to making soups, and as an astringent remedy.

Rhamnus utilis and probably *R. chlorophorus*, two very common shrubs, furnish in their fruit a large article of export, known as red and black dates. The former grows extensively on the mountains, and furnishes the well-known dye known as Chinese green indigo, and by the Chinese as lu-ko. It is prepared by chopping the twigs in small pieces and boiling them in water, to which a certain quantity of alum is added for fixing the color. This dye has been imported in considerable quantities into France, chiefly to the silk weaving districts about Lyons, for dyeing some of the more beautiful shades of green.

Setaria Species.—From the seed of the millet the Chinese make a fermented beverage in the following manner: The seeds are boiled till they burst, they are then spread out on a table and mixed with a small quantity of leaves from wheat; the whole is then put into a large leather jar, where it is left to ferment from one to four weeks. It is then placed in linen and pressed with stones, and the liquid so expressed forms huang-chin, or yellow wine. Besides this, a kind of brandy or spirit is prepared from viro, sweet potatoes, persimmon fruits, etc.

Soja Hispida.—The bean cheese or bean curd, so common in many parts of China, is made from white or yellow beans steeped in cold water till they are soft, when they are deprived of their skin by pressing them between the fingers, after which, they are reduced to pulp, by pounding them in a mortar or pressing them under a millstone; the pulp is passed through a sieve, and then some *lu-shui*—the residuum of sea-salt or nitre, or a gypsum solution is added, which coagulates the albumen; the water is taken off by pressure in linen cloth loaded with stones; this liquid is carefully thrown away, being said to be poisonous. The cake so obtained is salted, and sold fresh in the streets, or dried to the consistence of hard cheese. Flour for food is also made from these beans, as well as sauce or soy. This sauce, now extensively used in Great Britain and America, is prepared by steeping the beans in water for one hour; they are then half dried in the sun and mixed with wheat flour and allowed to ferment, being placed for that purpose in a hot damp place. The mould which develops itself in abundance on the beans is scraped off, the beans are then dried and put in salted water, which has been properly boiled and cooled (to expel air). The brown and black color of the sauce so obtained is supposed to be produced by a microscopic fungus resembling the ergot of rye, whose properties the soy is said to possess. These kind of beans are very extensively used in the manufacture of the now famous bean cake, which appears to be exported in enormous quantities. The beans being thoroughly crushed under heavy stone wheels turned by mules, are heated under water and the cakes compressed between iron hoops. The pressure is slowly and gradually increased by driving wedges with an enormous stone suspended as a pendulum and acting as a ram. The oil which runs from them into a kind of well, is black and very dense; it has a disagreeable smell, and is used for illuminating purposes, and for calking boats, and being mixed with lime it makes a kind of putty. A foreign firm at Nenchavang, some time ago, tried to extract oil from the beans by the more powerful and expeditious means of a hydraulic press, but the resistance to a sudden pressure was so great that hardly any oil could be obtained.

Sesamum orientale, *Arachis hypogæa*, *Cannabis sativa*, *Ricinus communis*, are among the oil-producing plants of this province. Some of these oils are exported to Canton to be purified and clarified there, and come back to Chefoo under the pompous but false name of tea oil. The castor oil plant is often cultivated in the

form of hedges, being considered an effective barrier against the intrusion of animals.

The Shantung province is also very rich in medicinal plants. A kind of native *ginseng*, found in sandy plains, and accordingly called sha-ren, is reported in quantities. The roots of the *Libanotis* and the fruit of the *Aristolochia* are famous drugs, while the leaves of the *Artemisia* are used as moxa. The products mentioned are only a few of those constituting the natural resources of the province of Shantung.

b. Animal Drugs.

American Leeches.—One of the oldest American leech dealers is of the opinion that the American leech is utterly valueless. Fine specimens from Mississippi and Pennsylvania proved to be wholly worthless. They are far inferior to even some European varieties of the *Hirudo decora*, which cannot easily be induced to bite unless blood be drawn to excite them. He considers six Swedish leeches equal to at least one hundred of any American variety. Those exported to America are generally full of blood, and at Rhode Island there are immense purging ponds in which the newly arrived leeches are placed, and left to digest their meal; it takes a year to accomplish this, and until it has been perfectly digested the leeches are useless. New Rem., November, 1876, p. 324, from Med. and Surg. Rep.

Cantharides, Change of Cantharidin.—R. Wolff, of Buenos Ayres, used for his experiments *Lytta aspersa*, which is there generally employed. On treating 100 grams with ether, 0.815 gram of cantharidin was obtained, besides some fixed oil which, after saponification, yielded 0.04 gram more of that principle. The lytta, exhausted with ether, was now extracted with warm water, the liquid evaporated to a syrupy consistence and precipitated with chloride of barium. The washed brown precipitate was mixed with an excess of hydrochloric acid, evaporated to dryness, and the residue exhausted with chloroform, which on evaporation and washing with ether left 0.46 gram of white tabular crystals which possess vesicating properties, are soluble in water, more in alcohol and ether, and rather freely in chloroform and in acetic ether. On evaporating the latter solution *cantharidin is left.* It is soluble in sulphuric acid, and on the addition of water cantharidin is precipitated, sulphate of ammonium remaining in solution. From its solution in potassa

it is precipitated in an unaltered condition on neutralization with an acid. Boiling with ammonia and evaporation to dryness causes this *cantharidin-ammonia* compound to combine with more ammonia. This second compound crystallizes from hot water in needles; it is also vesicating, is slightly soluble even in hot alcohol, ether, and chloroform, but dissolves in acetic ether, which, on evaporation, leaves cantharidin. It dissolves in sulphuric acid, from which solution no precipitation is effected by water. Acids seem to combine with it, for when its solution in muriatic acid is evaporated to dryness, the residue is freely soluble in hot water and precipitated by nitrate of silver, the precipitate being insoluble in nitric acid. Heated with potassa, it is partly decomposed into the first described ammonia compound. If cantharidin is dissolved in potassa, the solution precipitated by a salt of zinc (or copper, or magnesia), the precipitate redissolved in ammonia, and the solution supersaturated with an acid, the first described ammonia compound is separated in crystalline granules. A similar reaction takes place, probably, in cantharides; they contain magnesium salts, and when ammonia is generated in them through the agency of moisture, the conditions for the formation of that compound are present. The above results also explain why larger yields of cantharidin are obtained by treatment with acetic ether. The author argues in favor of preparations of cantharidin in place of the deteriorating and therefore unreliable cantharides. A. J. Ph., June, 1877, p. 316, from Arch. d. Ph., Jan. 1877.

Cod-liver Oil, Fishing and Production in Norway.—A very interesting account of codfishing in Norway is given in Ph. J. Trans. (April 7th, 1877), from which the following, specially relating to treatment of the livers for oil, is extracted: The livers reserved for the preparation of medicinal oil are all carefully examined, and those that are poor, have sustained injury, or have portions of gall adhering, are removed. The selected are then thoroughly washed and afterwards dried. The fishermen, many of whom make the oil themselves or sell to larger makers, put these prepared livers immediately into open barrels where the oil slowly exudes, and rising to the top is removed with large spoons. It is then when quite cold filtered three or four times through filtering-paper and the preparation is complete. Nothing more remains but to pour it into tin cans or oak barrels, and it is ready for market. The oil is described as of a straw-yellow, has nearly no smell nor taste, and is known as "*natural medicinal oil.*"

In the meantime other fishermen having carefully sorted, washed, and dried their livers, place them in a pot of tinned sheet-iron. This tinned pot is then put into a larger iron pot half full of water, which on becoming heated causes the livers immediately to begin to give out their oil. Other makers introduce steam from a boiler between the two pots, and others let the steam act directly on the livers. The first yield by these methods of regulated heat is also removed by spoons, filtered when cold, and reserved for medicinal use, under the names of "*steam-boiled medicinal*" and "*ordinary bright.*" The after-yield is used in medicine, though somewhat redder, and is called "*light-brown.*"

Finally, those portions of liver that will not dissolve by themselves or by mild heat, are roughly boiled down to yield "*brown*" or "*tanners' oil,*" the black residue being used with other fish refuse for manure.

The cod-liver oil prepared at Lofoten finds its way in the first stage of its travels to Bergen, where it begins to arrive in May, and whence it finds its way into general commerce.

INORGANIC CHEMISTRY.

OXYGEN.

Ozone, Powder for its Production.—Mr. Lender makes use of a mixture of equal parts of peroxide of manganese, permanganate of potassium, and oxalic acid, which, when brought in contact with water, develops ozone rapidly, and without inconvenience to those exposed to it when a teaspoonful or two are acted on. John L. Davis draws attention to the circumstance that great care must be exercised when making this mixture, else violent explosion may result. It should never be mixed in a mortar, but the ingredients, in coarse powder, should be carefully mixed on paper with a spatula. If *fine* powder is used, the mixture is liable to explode even under these circumstances. Small quantities only should be mixed at a time. A. J. Ph., Sept. 1876, p. 407.

HYDROGEN.

Hydrogen, Purification.—E. Scholig has shown by his experi-

ments that it is possible to purify hydrogen completely from its compounds with arsenic, antimony, phosphorus, carbon, and sulphur, by passing it through a wash-bottle containing pieces of pumice saturated either with a neutral, acid, or alkaline solution of permanganate of potassium, or through a series of such wash-bottles.

Arsenuretted hydrogen requires a neutral solution of permanganate, or one containing a little sulphuric acid. The arsenic is retained in the form of arsenious acid. The passage of the gas should be moderately fast.

Antimonuretted hydrogen requires the same. The antimony is retained as oxide and as acid.

Phosphoretted hydrogen is also completely decomposed under these conditions if the passage of the gas is not too fast. The phosphorus is retained as phosphoric acid.

Carburetted hydrogen was completely deprived of its odor by its passage through a neutral solution of permanganate, and even illuminating gas lost, during its passage through the liquid, all those components which are usually removed by passing it through tubes heated to redness. The carbon is oxidized to carbonic acid.

Sulphuretted hydrogen is deprived of its sulphur by passing it through an alkaline solution of permanganate, the oxidation being complete even when the current is rapid.

All of these gases may be removed, when in association, by passing them through acidulated solution of permanganate, and then through solution of caustic potassa; the latter removing the carbonic acid formed, and the sulphuretted hydrogen.

The author's experiments furthermore prove that pure hydrogen is capable of reducing solutions of silver, a reaction which is of importance in connection with Marsh's test for arsenic. Schweiz. Wochenschr. f. Ph., No. 5, 1877, p. 37.

SULPHUR.

Sulphur.—The observation of a workman in one of the sulphur pits of the Romagna, "that the presence of gypsum in the *Doppione* (the subliming oven, containing a double row of pots, is so called) destroyed the sulphur," induced Fausto Sestini to ascertain the influence, if any, which the presence of gypsum exerts on the sulphur during its sublimation. He finds that when a mixture of sulphur and gypsum is heated, the gypsum loses all of its water at 130° C. (= 268° F.), while at about 440° C. (= 824° F.), the sul-

phur reduces the gypsum to sulphide of calcium. There is consequently a loss of sulphur, which combines with the oxygen of the gypsum. In Sicily the process of sublimation is not resorted to, the sulphur being run off in a melted condition. In this process, however, the presence of gypsum is also disadvantageous, since a larger proportion of sulphur is burned up (it being the source of the heat) to drive off the water liberated from the gypsum. The presence of carbonate of calcium during the process of distillation (sublimation) is found by the author to be even a greater disadvantage than the presence of sulphate. Arch. Ph., Nov. 1876, p. 427.

Sulphur, New Reagent for its Detection in Organic Compounds.—Vohl recommends the following reagent as much superior to that recommended by him in 1863, and subsequently by Bunsen, for the detection of sulphur in organic compounds: The new reagent has the merit over the older one—which consists in heating the compounds with sodium, and proving the presence of sulphide of sodium by nitroprusside of sodium—in that it produces no color reaction with the oxygen compounds of sulphur. It is prepared by saturating a mixture of one measure of distilled water and two measures of glycerin, at a boiling temperature, with slaked lime, and afterwards with recently precipitated hydrate of lead, or with elutriated litharge; after cooling, the liquor is decanted, and preserved in well-stoppered bottles from contact with carbonic acid. The reagent is used by heating it to boiling with the organic body, which is thereby colored black, if sulphur not in combination with oxygen is present. A. J. Ph., Sept. 1876, p. 409, from Ber. Deutsch. Ch. Ges., 1876, pp. 875–877.

Milk of Sulphur.—C. W. L. Dietrich has examined eight samples of commercial precipitated sulphur, and found all except two to contain calcium sulphate, the quantities found being 43.6, 25.9, 47.7, 47.3, 46.2, and 23.7 per cent. respectively. No arsenic or other impurities were found in these samples, but those containing no sulphate of calcium contained one-third of one per cent. of silicate. A. J. Ph., Sept. 1876, p. 389.

Sulphuric and other Mineral Acids, Reagent.—Huber's reagent for free mineral acids is composed of a mixture of molybdate of ammonia and ferrocyanide of potassium in solution. If a few drops of this reagent are added to a colorless liquid containing, besides salts of the alkalies and earths only, faint traces of free mineral

acid (sulphuric, hydrochloric, nitric, phosphoric, arsenic, sulphurous, or phosphorous acids), an immediate reddish-yellow color is produced, while decided traces of these acids occasion more or less deep brown color or turbidity, which, however, disappears upon the addition of the slightest excess of alkali. Boric and arsenious acids do not so react. Ph. Centr. H., Oct. 5th, 1876, p. 346.

Fluorescein as a Test for Acids and Alkalies.—In a manufactory of anilin colors at Frankfort, fluorescein has been used for a considerable time in place of litmus as a test, and is found to possess advantages superior to those of carminic and rosolic acids, and eosin, which have also been used for this purpose. The beautiful fluorescence of its solution disappears suddenly in the presence of the least trace of free acid, and is at once brought back by free alkali. These transitions are so sharp and characteristic that no doubt can exist as to the character of the liquid. Further, carbonic acid, which retards the transition with litmus, has no influence on fluorescein. The new substance is to be especially recommended in colored solution where the coloring is not too strong; the disappearance and return of the fluorescence is almost more manifest here than in colorless solutions. On the other hand, fluorescein is inapplicable in the presence of free acetic acid, which dissolves it also with fluorescence. It is also advisable not to use it where fine white precipitates are suspended in colorless solutions (*e. g.*, in sulphuric acid with baryta), as these mask the fluorescence. The precipitates may be allowed to settle before the indicator can be used to reveal the reaction. New Rem., March, 1877, p. 72, from Polytech. Rev.

CHLORINE.

Liquid Chlorine, Preparation.—The preparation of this element in the liquid form from crystals of hydrous chlorine (Cl_5H_2O ($O = 16$)) by the methods generally described is a somewhat tedious operation, but may be rendered comparatively easy, according to A. Senier and A. J. G. Lowe, by the use of a cotton-wool strainer to remove the hydrous chlorine from its mother liquor, as follows: A stream of chlorine gas is passed through a bottle, almost two-thirds full of water, and surrounded by a freezing mixture of sulphate of sodium and hydrochloric acid. Care is taken to prevent the water from freezing, and frequent agitation accelerates the formation of the hydrous chlorine. When by the

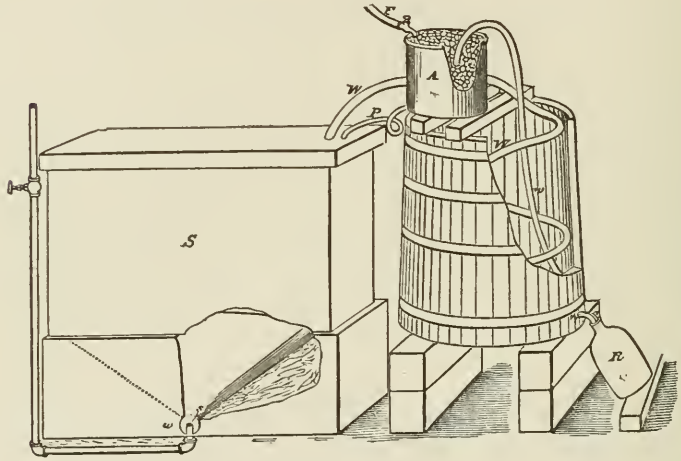
deposition of crystals the contents of the bottle are fairly thick, they are poured through a funnel into a piece of combustion-tubing sealed at one end. A plug of cotton-wool, attached to a piece of twine, is inserted into the combustion-tube, and is slowly pressed downwards by means of a glass rod. In this way, the crystals are separated from the chlorine water, and are compressed tightly in the bottom of the combustion-tube, while the water fills the tube above the plug and is poured off. By means of the string the plug is withdrawn, when more wet crystals may be added and the process of straining repeated. The combustion-tube should be placed in a freezing mixture from time to time. When sufficient hydrous chlorine is collected, the tube containing it is surrounded by a freezing mixture, and carefully sealed within about two inches of the surface of the crystalline mass. When cool it is surrounded by wire gauze and heated in a water- or air-bath, to from 100° to 150° F. In the course of ten minutes the crystals will be completely decomposed, the liquid chlorine appearing below the chlorine water as a dense, deep yellowish, oily-looking liquid. Ph. J. Trans., March 10th, 1877, p. 729.

BROMINE.

An Improved Bromine Still.—W. Arvine has devised a new apparatus (see Fig. 45), the object of which is to economize the material used in the manufacture of bromine by saving a portion of the oil of vitriol and manganese or alkaline chlorate, and by dispensing with the caustic alkali heretofore employed for absorbing the vapors that escape uncondensed from the worms. *S* is the still proper, wherein the bromine is generated by the usual methods. This still may be made of any of the materials commonly used for the purpose, such as stone, terra-cotta, pottery ware, or lead; but this still has a funnel-shaped bottom or floor, in the form of an inverted cone, which may be more or less broad in proportion to its depth, according to the nature of the materials used. The apex of this funnel or cone is provided with two perforations; *s* for the admission of steam, and *w* for the withdrawal of the exhausted materials. This still is provided with a condensing worm, *W*, which is surrounded with cold water while in use, and the receiver, *R*, is also provided with a worm, *w*, which serves for additional condensing surface, and an outlet for the uncondensed gases and vapors of chlorine, chloride of bromine, air, etc., which escape

in considerable quantities from the worm and receiver. The second worm, *w*, continues to the absorber, *A*, which is preferably a stone or earthen jar, of such size in relation to the still as experience would show to be necessary. Usually about one-twentieth the capacity of the still will suffice for the absorber. The jar, *A*, is filled with suitable material, such as coke, fragments of stone,

Fig. 45.



pottery, glass, or any convenient material which, in a dry or moist state, may present sufficient and proper surface for the condensation and absorption desired. The small pipe shown in the drawing, and terminating in the faucet, *F*, serves to convey bittern or other suitable liquid for absorbing the vapors and gases from the worm, *w*, and conveying them back to the still, *S*, by the curved pipe, *P*. By this arrangement of still, the offensive gases and vapors which usually escape into the air are entirely absorbed and saved, and the air is allowed to escape freely from the top of the absorber. As the chlorine and chloride of bromine serve to liberate bromine from its natural combinations, their complete return to the still increases the amount of bromine obtained, and lessens the amount of manganese, or alkaline chlorate, and vitriol generally required, while the conical bottom of the still is easily rinsed clean with water, or is cleansed from sediment by the rapid withdrawal of the exhausted liquor. The admission of the steam at *s*, has the advantage that the manganese and vitriol are thoroughly

mixed. By dispensing with solution of caustic soda for the absorption of the above-named vapor, there is a further economy of oil of vitriol and manganese, while the workmen are not annoyed by the vapors which, under the old method, invariably escaped into the air. New Rem., April, 1877, p. 105, from Scient. Amer.

Hydrobromic Acid.—Attention is drawn by Prof. Maisch to Dr. De Witt C. Wade's method of obtaining a solution of hydrobromic acid, sufficiently pure for medicinal exhibits. The original formula, as published in the "Peninsular Medical Journal," 1875, is as follows: Dissolve ℥x, ℥vj, gr. xxviij of bromide of potassium in 4 pints of water, and add ℥xiij, ℥j, gr. xxxvij of tartaric acid; bitartrate of potassium is formed, the greater part of which crystallizes out, and a solution, containing about $40\frac{1}{4}$ grs. HBr to the fluid ounce (Imp. measure), and a little bitartrate and bromide of potassium is obtained; bromide of potassium being employed in slight excess. The proportion in this formula being by the weights and measures of the Br. Ph., Prof. Maisch has accommodated them to those of the U. S. P., as follows:

Water, f℥j;	Bromide of potassium,	80 grs.;	Tartaric acid, 100 grs.
" Oj;	" "	℥ij, 320 grs.;	" " ℥iij, 160 grs.
" Oiv;	" "	℥x, 320 grs.;	" " ℥xiij, 160 grs.

The bromide should be dissolved in three-fourths of the water, and the tartaric acid in the other fourth; after mixing the solution well, it is of advantage to expose the mixture for some time to a temperature of 32° F., and thus allow the greater part of the cream of tartar to crystallize out. A. J. Ph., Jan. 1877, p. 42.

Hydrobromic Acid, Preparation.—Ch. Rice recommends the following method for its preparation, whereby he obtains an acid of greater purity than it is possible to obtain by the treatment of bromine with sulphhydric acid: Dissolve 1191 grains of bromide of potassium in 15 fluid ounces of water, add 1500 grains of powdered crystals of tartaric acid, heat until the whole is dissolved, and set the solution aside in a cold place, frequently stirring. After twenty-four hours add 2 pints of alcohol, and again set aside for twenty-four hours. Separate the liquid from the precipitated cream of tartar by filtration, recover the alcohol by distillation, and evaporate the remaining solution in a sand-bath, under constant stirring, to 16 fluid ounces. This acid has a sp. gr. of 1075, and contains 10 per cent. HBr. By further evaporation it may be concentrated to 1480 sp. gr. (containing about 46 per cent. of HBr)

but if heated beyond this point, hydrobromic acid vapor, instead of water, is given off. New Rem., April, 1877, p. 107.

IODINE.

Iodine, Determination of Minute Quantities in Potable Waters, etc.—Chatin communicates the following method for determining minute quantities of iodine, which Poggiale recommends as reliable: Lime and magnesia are precipitated with carbonate of potassium in excess, the solution is evaporated to dryness, and the residue heated to low redness to destroy organic matter; the excess of carbonate of potassium used being larger in proportion to the quantity of organic matter present, otherwise a portion of iodine will be dissipated by the heating. The residue is treated with water, the clear solution is decanted, evaporated, and the dry residue is treated several times with 90 per cent. alcohol, the united solutions being then diluted with half a volume of water, evaporated to dryness, and heated strongly for some time to destroy any organic matter possibly remaining. The dry residue so obtained is now ready for the tests. It is moistened with a few drops of water and three or four drops of the concentrated solution formed are distributed on a porcelain surface. To one of these protochloride of palladium is added; to a second, a trace of starch paste, followed by nitric acid; to a third, starch paste and sulphuric acid; and to a fourth, starch paste and chlorine water or perchloride of iron. Soils, minerals, and metals are treated in a finely powdered condition with boiling carbonate of potassium solution, and the solution obtained is then further treated as above. Ph. Centr. H., July 6th, 1876, p. 237.

Iodine.—E. Puchot finds that the sensibility of iodine as a reagent for starch is affected by certain nitrogenous organic matters, such as albumen. If albumen is poured upon iodide of starch suspended in water the color disappears. If albumen is added to a solution of starch, saturated iodine water produces no coloration. Ch. News., August 18th, 1876, p. 72, from Compt. Rend., July 17th, 1876.

Hydriodic Acid, Preparation.—Prof. H. Kolbe finds the following the most satisfactory method for preparing this acid: A retort containing ten parts of iodine is filled with carbonic acid gas; afterwards one part of phosphorus in introduced in small quantities, heat is then applied for a short time to the liquid mixture of bi-

and teriodide of phosphorus, and when cooled again four parts of water are added. A copious evolution of hydriodic acid gas, free from iodine, takes place on the application of a moderate heat. A. J. Ph., July, 1877, p. 314, from J. Prakt. Chem., 1877, p. 172.

Dilute Hydriodic Acid.—H. F. Meier recommends the following convenient method for preparing a dilute acid, which he finds to answer a good purpose in preserving syrup of ferrous iodide (which see): Dissolve 166 grains of iodide of potassium in 2 fluid ounces of water, and 153 grains of tartaric acid in 4 fluid ounces of alcohol; mix the solutions, and when the precipitate (of bitartrate of potassium) has subsided, filter, wash the filter with a small quantity of 66 per cent. alcohol, and evaporate to 2 fluid ounces. Each fluid drachm contains 8 grains of anhydrous acid. It is important that the alcohol is promptly evaporated, as the acid decomposes more readily in alcoholic than in aqueous solution. Drug. Circ., Dec. 1876, p. 198.

Iodic Acid, Determination in Nitric Acid.—Ernst Bills recommends the following method for detecting iodic acid in nitric acid by means of sulphhydric acid and starch solution: 3 to 5 grams of the nitric acid are diluted with an equal weight of water in a test-tube, a few drops of starch solution are added, followed by a few drops of sulphhydric acid water. If the nitric acid contains but one-thousandth of one per cent. of iodic acid a sharply defined blue ring of iodide of starch will be formed at the point of contact. The reaction is so delicate that one ten millionths gram will afford a distinct and unmistakable reaction. Ph. Centr. H., November 23d, 1876, p. 401.

PHOSPHORUS.

Phosphoric Acids, Action of the Free Acids upon Metallic Salts.—Isaac W. Morgan has made a series of investigations, the purpose of which was to ascertain what normal metallic salts, in solution, will form precipitates by addition of solutions respectively of free orthophosphoric, pyrophosphoric, and metaphosphoric acids; in case of such formation of precipitates, what quantities of certain acids are needed to dissolve them; and in case of non-formation of precipitates, what proportion of the phosphoric acids must be neutralized by alkalies in order to cause the precipitates. The salts experimented with were the chlorides of barium, calcium, and iron (ferrous, ferric, and tincture); the sulphates of magnesium, aluminium, and iron (ferrous); the nitrates of silver and lead and acetate

of lead. The results are detailed in tabulated statements, from which it appears that, in the production of metallic precipitate, the sharpest distinction between the phosphoric acids appears to be, with ferric salts, between orthophosphoric acid and the other two. Both ferric pyrophosphate and ferric metaphosphate are soluble in excess of their respective phosphoric acids, if in watery solution, but, in case of metaphosphate, not soluble in the alcoholic solution of the pharmacopœial tincture. Lead and silver salts are precipitated by each of the three forms of phosphoric acid, the metaphosphate of lead being soluble in excess of its acid (a distinction from both of the other phosphoric acids). The distinction between ferrous and ferric salts, by metaphosphoric acid, is well defined. The determination of the amount of alkali (soda) necessary to produce precipitations in solutions of metallic salts, in which phosphoric acid alone produced no precipitate, is also of interest, since it throws some light upon the subject of precipitation produced by commercial acids containing alkaline phosphates, and tends to settle some doubts as to how far the metallic precipitates, stated in books for the *free* phosphoric acids, have been due to the unknown presence of their alkaline compounds. A. J. Ph., Dec. 1876, p. 534.

Acidum Phosphor. Dilut., Preparation from Common and from Amorphous Phosphorus.—Richard V. Mattison gives the following method pursued at his laboratory for preparing dilute phosphoric acid on a large scale: Into a tub of 25 gallons capacity, placed in the open air, a 10-gallon graphite crucible is placed, resting upon some smooth bricks. Upon the top of the crucible a funnel is inverted, and the edges are carefully luted with flaxseed meal or clay, the quantity of phosphorus required having previously been placed into the crucible. Into the spout (of the funnel?) a glass tube, reaching to the bottom of the crucible, is inserted, and at the apex a small funnel, through which nitric acid, slightly diluted, is poured upon the phosphorus. The source of heat is waste steam from the laboratory, which, as it condenses, keeps the tub filled with hot water, and supplies sufficient heat to cause the reaction to take place regularly. The process requires no further attention, except that water and nitric acid are added as occasion requires. After reviewing the various processes that have been proposed from time to time, he believes them all to be unsuited for the pharmaceutic laboratory, and proposes the following as deserving the attention of the revisors of our next Pharmacopœia: Add 5 troy ounces, or a sufficient quantity, of nitric acid to 8 fluid ounces of water

contained in a porcelain capsule; to this mixture add 370 grains of *amorphous phosphorus*, raise the mixture to boiling, and evaporate until the solution has lost the odor of nitric acid. When perfectly free from nitric acid, it is diluted to 20 fluid ounces, or to the requisite specific gravity, the arsenic and other impurities, if present, having previously been removed. Owing to the ease with which amorphous phosphorus is converted into phosphoric acid by nitric acid, the process is perfectly free from danger, and is completed in fifty minutes.

Of a sample of acid prepared by this process, one hundred grains were neutralized by twenty-four and six-tenths grains of perfectly dry bicarbonate of potassium; solution of nitrate of silver produced a yellow precipitate; it did not coagulate albumen, or precipitate with tincture of ferric chloride, when mixed in various proportions. A. J. Ph., Jan. 1877, p. 8.

Hypophosphites.—Patrouillard draws attention to impurities which the soda and lime salts occasionally contain:

Hypophosphite of sodium is white, usually amorphous, although it may be obtained crystalline, inodorous, deliquescent, and completely soluble in water, and even concentrated alcohol. One part dissolves in about two parts of water and in fifteen parts of 90° alcohol. The impurities found in this salt are due to a want of care in its preparation. To obtain it, it is usual to decompose hypophosphite of barium with sulphate of sodium; hypophosphite of barium is occasionally found as impurity, an insufficient quantity of sulphate of sodium having been added, but more generally the latter has been added in excess, and this is consequently frequently, and sometimes largely, present as impurity. Phosphate of sodium may also be present, being formed by the decomposition of the hypophosphite during the evaporation. Both remain undissolved in alcohol, and are distinguished by well-known tests.

Hypophosphite of calcium is white, unaltered by exposure to the air, soluble in six parts of distilled water, and insoluble in alcohol. The salt is rarely completely soluble in water, because in its preparation, during the evaporation of the solution, there is always formation of phosphite and consecutively of phosphate of calcium. When triturated with water, it ought not to give off the alliaceous odor characteristic of phosphuretted hydrogen. Barium salt, or sulphates, may be present as impurities. Ph. J. Trans., July 22d, 1876, p. 77; J. de Ph. et de Chim. (4), xxiv, 25.

BORON.

Boron.—The experiments of W. Hampe convince him that the crystals which Wöhler and Sainte-Claire Deville have obtained, and recognized to be crystallized boron, are not pure boron, but must be regarded as a boron compound. This is true both for the black and yellow crystals. Both of these are obtained by melting boric acid or amorphous boron with aluminium; the black crystals being obtained by a shorter time of melting and a lower temperature, while the yellow crystals are obtained by a longer heating and higher temperature. The author's analyses prove the black crystals to contain 17.24 per cent. aluminium, corresponding to the formula AlB_{12}, while the yellow crystals proved to contain also carbon, amounting to 3.76 per cent. Aluminium was present to the amount of 13.15 per cent., and the composition of the compound, therefore, corresponds to the formula $C_2Al_3B_{48}$. Schweiz. Wochenschr. f. Ph., No. 12, 1877, p. 92.

CARBON.

Vegetable Charcoal.—Jaillard has found that wood charcoal always contains variable quantities of organic substances, which have escaped destruction by the high temperature employed for its production; among these he has found acetate of potassium to the amount of 0.3 per cent. of the charcoal. This statement is criticized in "Zeitschr. Œst. Apoth. Ver." (No. 12, 1877, p. 199), to the effect that while ordinary charcoal is never completely charred, it is certain that when such charcoal has been heated to redness in the absence of air, all organic matter contained therein must be destroyed.

Bisulphide of Carbon, Application for Generating Sulphurous Acid for Disinfecting Purposes.—Thos. W. Keates suggests the use of bisulphide of carbon as a material from which to evolve sulphurous acid. This substance is, as is known, quite volatile and inflammable (it is explosive when ignited in quantities). It contains a large proportion (84 per cent.) of sulphur, and when mixed with kerosene and burned in an ordinary lamp, will evolve such an amount of sulphurous acid vapor as to disinfect a moderate apartment very rapidly. The method of employing the lamp is described by Mr. Keates, who has devised some peculiar sort of lamp for using the bisulphide of carbon most advantageously; but an ordinary lamp is all that is necessary. New Rem., Feb. 1877, p. 46.

Bisulphide of Carbon, Value as an Insecticide.—J. B. Schnetzler, of the Lausanne Academy, recommends the use of bisulphide of carbon as a means of destroying the insects which infect herbaria and entomological collections. Boxes were constructed, each capable of containing five fasciculi of 200 plants each, of the Swiss Academy, which had been attacked by *Anobium paniceum*. Four ounces of bisulphide of carbon were poured into the five fasciculi; the box was tightly closed, and the whole left for a month. All the insects were destroyed, and no injury was done to the specimens or to the paper to which they were fastened. A. J. Ph., Nov. 1876, p. 517, from Pop. Sci. Mo., Oct. 1876.

Bisulphide of Carbon, Value as a Preservative Agent.—In confirmation of the experiments of Hugo Schiff, by which he determined the value of bisulphide of carbon as a preservative agent ("Ber. Chem. Ges.," No. 10, 1876), Phil. Ziller furnishes further testimony as to its value in this direction. The substances to be preserved are either suspended from hooks, or laid on perforated disks or shelves within a proper receptacle, which must be perfectly air-tight; this may be either a simple specimen bottle or a specially constructed box. It is necessary to use perfectly pure CS_2. Thus the author has found that forty pounds of meat, in the form of undissected animals, may be preserved for an indefinite time in an atmosphere containing only 5 grams of CS_2. An exceedingly minute quantity is necessary to preserve fresh bread, vegetables, and fruits of all kinds. On opening the vessels containing the latter, a short exposure to the air suffices to make them at once fit for eating. In the case of meats, boiling or roasting is necessary to remove the peculiar odor of CS_2, but there remains adhering to it a peculiar odor of volatile fatty acids, which makes it resemble venison, and which may perhaps be somewhat disagreeable to some persons. The preservative power of CS_2 depends mainly on the fact that it coagulates the albuminoids, and that it diminishes the amount of free water in the preserved substance. New Rem., Sept. 1876, p. 267, from Ber. Ch. Ges., 1876.

CYANOGEN.

Cyanide of Potassium.—By the ordinary method of its production, melting together ferrocyanide and carbonate of potassium, a portion of cyanate is formed, which it is difficult to remove completely even when using strong alcohol as a solvent. It is found,

however, that when metallic potassium is substituted for carbonate of potassium, cyanide of potassium alone is produced. Erlemeyer suggests that if a pure cyanide of an alkali is required, irrespective of the base, metallic sodium may be substituted for the more expensive potassium, and the compound 2KCy + NaCy thus obtained. Zeitschr. Œst. Ap. Ver., No. 13, 1877, p. 210.

Wash-blue.—H. G. Debrunner makes some critical remarks upon wash-blue and its preparation. He considers the introduction of oxalic acid into an article so widely applied in domestic economy to be objectionable, and recommends instead the use of ferrocyanide of potassium to effect the solubility of the Prussian blue, the true soluble blue obtained by double decomposition between ferric sulphate or chloride and ferrocyanide of potassium, and washing until the mother liquors are removed and the compound begins to dissolve, being too expensive. The ordinary soluble blue may be obtained by adding to a solution of ferrocyanide of potassium an equal quantity of copperas, also dissolved, treating the white precipitate with an oxidizing mixture of nitric and sulphuric acid, washing the blue compound produced, and incorporating it while still moist (containing about 60 per cent. of water) with ferrocyanide of potassium, about 12 pounds of which are required for 100 pounds originally used. After passing the mixture repeatedly through a mill, it is dried at a temperature of about 120° F., and is then obtained in form of a light, dark-blue powder (when in lumps of a bronze tint), which is perfectly soluble in water. The author has made some experiments upon the best methods of determining the character of commercial wash-blues, which may be profitably consulted in the original paper. A. J. Ph., February, 1877, pp. 64–68.

Soluble Prussian blue, in a durable liquid form, is obtained by dissolving 5 grams of ferrocyanide of potassium, 5 grams of iron potassa alum ($K_2Fe_24SO_4,24H_2,O$ (O=16)), and 1 gram of borax, in 200 grams of distilled water, adding 5 or 6 grams of pure diluted nitric acid, and afterwards 2 grams of liquor ferri sesquichlorati, Phar. Germ. (sp. gr. 1.480 to 1.484 contain 15 per cent. of iron). A. J. Ph., Nov. 1876, p. 511, from Apoth. Zeit., No. 31.

POTASSIUM.

Potassa.—Ad. Carnot recommends the following qualitative test for potassium salts: 0.5 gram of basic nitrate of bismuth is dis-

solved in a little hydrochloric acid, and 1–1.25 gram of crystallized hyposulphide of sodium is dissolved in a few c.c. of water, the first solution is added to the second, and strong alcohol is then added in excess to the mixture. If a few drops of the reagent so obtained are added to the solution of a potassium salt, a yellow precipitate is immediately formed; if the potassium salt is not dissolved a distinct yellow coloration is produced. The reaction is applicable to the potassium salts of mineral acids. Barium and strontium are the only bases that are likely to occasion error on account of the white double salts which they form with the reagent. But these bases are seldom found associated with potassium, and are readily recognized and removed. If the solution contains but a few milligrams of potassa, it must be evaporated to a small volume, or even to dryness, before applying the test. The reaction is also applicable to the quantitative determination of potassa, and the author gives the details of the method by which it is applied. Ph. Centr. H., Nov. 30th, 1876, p. 410.

Pure Potassa, *Preparation.*—The method of Wöhler, heating 1 part of nitre and 2 parts of copper to redness, was found unsatisfactory both by Graf, who found the product to contain nitre, and by Pollaci, who found it to contain copper. The latter recommends the substitution of iron filings for copper, and heating the mixture in an iron crucible. It does not appear that he has examined the product for the presence of nitre. Zeitschr. Œst. Ap. Ver., July 1st, 1876, p. 299.

Iodide of Potassium, *Preparation.*—Pellagri finds that iodate of potassium, when in dilute solution, is readily reduced to the condition of iodide of potassium when it is agitated with iron filings. The reduction is facilitated by heat. Chiappe and Mallesci recommend the application of the method in the industrial production of iodide of potassium. Ph. Centr. H., No. 12, 1877, p. 90.

Iodide of Potassium, *Action of Light.*—According to Vidau, iodide of potassium becomes yellow by the influence of light alone, but Battandier is of the opinion that this may occur by the action of air alone. Hager is inclined to the same opinion as Battandier, and cites an instance in which iodide of potassium had turned yellow after being kept in a dark closet for four weeks. At the same time he admits that the iodide of potassium contains a small percentage of iodide of sodium, and that this may perhaps be the primary cause of the coloration. Ph. Centr. H., No. 3, 1877, p. 18.

SODIUM.

Soda, New Method of its Production from Common Salt.—H. Grüneberg and J. Vorster propose the following method: Salt and alumina are mixed with water to a pulp; the mass is dried, broken into small pieces, and treated with steam heated to dryness (?). Hydrochloric acid then escapes and aluminate of sodium remains behind; the latter is freed from admixture by lixiviation, and either decomposed by carbonic acid or by caustic lime. Instead of alumina, ferric oxide or any suitable metallic oxide may be used. If caustic potash is to be prepared, the common salt is replaced by chloride of potassium. New. Rem., Jan. 1876, p. 9, from J. Chem. Soc.

Sulphate of Sodium, Determination of the Presence of Sulphate of Magnesium.—Fr. Arthen avails himself successfully of the difference in the specific gravity of 10 per cent. solutions of sulphate of magnesium and sulphate of sodium respectively, for the quantitative determination of the former in the latter. The sp. gr. of a 10 per cent. sulphate of magnesium solution at 15° C. (= 59° F.) is 1.1058, while a sulphate of sodium solution, of corresponding strength and temperature, has a sp. gr. of 1.0917. A sample of the salt is heated in an evaporating-dish at a temperature of 200° to 250° C. (= 392° to 482° F.), until the water of crystallization is completely expelled. 10 grams of the residue are then dissolved in 90 grams of water, the temperature is brought to 15° C. (= 59° F.), and the sp. gr. ascertained. The quantity of sulphate of magnesium present is then determined by the aid of the following table:

Sp. gr.	Contains sulphate of magnesium.	Sp. gr.	Contains sulphate of magnesium.
1.09170	0 per cent.	1.09986	60 per cent.
1.09306	10 "	1.10122	70 "
1.09442	20 "	1.10258	80 "
1.09578	30 "	1.10394	90 "
1.09714	40 "	1.10530	100 "
1.09850	50 "	(1.10580 ?)	

Intermediate sp. gravities will readily permit the calculation within 1 per cent. of the magnesium salt. Ph. Centr. H., Feb. 28th, 1876, p. 338.

AMMONIUM.

Iodide of Ammonium, Solubility in Ether.—E. M. Wells has found that ether, sp. gr. 0.715, will dissolve, at 60° to 65° F., 2.29 per cent of iodide of ammonium, while ether of sp. gr. 0.742 will dissolve 2.60 per cent. He also finds that

Bromide of ammonium is soluble to a small amount in ether of sp. gr. 0.715, while ether of sp. gr. 0.742 will dissolve 2.00 per cent. He has been unable to find the solubility of either of these agents in ether mentioned in any of the standard works at his command.* A. J. Ph., Nov. 1876, p. 491.

Bromide of Ammonium (NH_4Br).—The following formula for its production has been adopted by a commission on "Standard Formulas" of the Pharmaceutical Society of Paris: Bromine is added very slowly to water of ammonia, under constant stirring, and until the liquid shows a very faint excess of bromine. A few drops of ammonia are now added to overcome this excess, and the solution is evaporated to the point of crystallization. The salt is so obtained in colorless prisms, which are volatile without decomposition. Its watery solution must not become colored on addition of a few drops of hydrochloric acid, and on adding to it a small quantity of starch paste and slightly yellowish nitric acid, no blue or violet color must make its appearance. New Rem., April, 1877, p. 125, from Rép. de Pharm., Nos. 2 and 3, 1877.

CERIUM, LANTHANUM, DIDYMIUM.

Cerium.—Hillebrand and Norton have had opportunity to study the properties and character of this metal, which they find to have the color and lustre of iron, and to be capable of being highly polished. It retains its lustre for some time in dry air, but in moist air soon changes, and acquires the colors of heated steel—yellow, blue, and gray. The remelted metal possesses the hardness of pure silver; it is extremely ductile; its sp. gr. is 6.628–6.728. Its melting-point is lower than that of silver, while it is considerably higher than that of antimony. It burns at a much lower temperature than does magnesium, simple friction with a needle causing the evolution of bright sparks, which are also pro-

* The percentages of the two substances dissolved are—evidently by a misprint—not in accord with the amounts stated to be dissolved in given quantity of ether, etc., being given as 0.22, 2.60, and 0.20 per cent., while the results obtained are as above quoted, or, $\frac{5}{218}$, $\frac{9}{345}$, and $\frac{5}{249}$.—Rep.

duced abundantly, notwithstanding its comparative softness, when it is struck upon flint in the manner of an ordinary steel. The wire may be ignited in the flame, and burns with a light of even greater intensity than magnesium. It burns with great lustre in chlorine gas, with more difficulty in bromine vapor, and without flame in iodine, sulphur, and phosphorus vapor, or gaseous cyanogen. It very slowly decomposes water at the ordinary temperature; cold sulphuric acid and cold red fuming nitric acid do not act on it at all; but hydrochloric acid, either dilute or strong, dissolves it readily, the latter under violent evolution of hydrogen.

Lanthanum was found by the author to correspond very closely to cerium in its chemical relations; in its relation to chlorine, bromine, iodine, cyanogen, sulphur and phosphorus vapor, water, hydrochloric and sulphuric acid, it is closely analogous to cerium; conc. nitric acid, however, attacks it slightly. It is more readily affected by exposure to the atmosphere, is somewhat harder, and not as ductile as cerium; its melting-point appears to be about the same, while its combustion-point is much higher, but, exposed to flame, it burns with splendid luminosity. Its sp. gr. is 6.163.

Didymium is more nearly related to lanthanum than to cerium; the color is not as white, and it inclines unmistakably to yellow, but less so than does bismuth. Like lanthanum it is affected by dry air, but does not show the immediate steel-blue color, but rather becomes yellowish at first. It is but little harder than cerium, requires exposure to flame for ignition, but then burns with great luminosity. Its sp. gr. is 6.544. Arch. Ph., November, 1876, p. 446.

Oxalate of Cerium.—Henry G. Greenish, in a paper read before the School of Pharmacy Students' Association (London), after reviewing the history of cerium and of the introduction of its salts into medicine, draws attention to the fact that oxalate of cerium, as found in commerce, is very impure. The chief impurities, found by six quantitative analyses, were lead, iron, calcium, magnesium, and a soluble salt of cerium, present, however, usually in small quantity. Besides these impurities, however, oxalate of cerium always contains notable quantities of the oxalates of lanthanum and didymium, the proportions depending on the proportion of cerium to these latter in the mineral used in its manufacture. The presence of these metals is accounted for by the imperfect methods of separation; the principal methods being reviewed by the author and found deficient. Among these, he finds the method of Erk ("Jour. Chem. Soc.," 24, 494) to give the most satisfactory

results. This consists in dissolving the oxides in nitric acid, evaporating until most of the nitric acid is driven off, and boiling in a large quantity of very dilute sulphuric acid. The cerium is precipitated as subsulphate, which, however, is not quite free from lanthanum and didymium. The presence of so large a proportion of oxalate of lanthanum and didymium in the oxalate of cerium of commerce, renders it doubtful whether the therapeutic action of cerium is due to that metal alone, or whether it is shared equally by the lanthanum and didymium. Ph. J. Trans., May 12th, 1877, p. 909.

MANGANESIUM.

Manganic Oxide, Formation of Saline Combinations.—E. Frémy has discovered that under certain conditions peroxide of manganese will unite with sulphuric acid, and form a compound of the composition $MnO_2,2SO_3$. It was formed by mixing together 100 grams of permanganate of potassium and 500 grams of sulphuric acid, previously diluted with 150 grams of water, and allowed to cool, and allowing the mixture to stand several days. A yellow liquid is produced, from which he succeeded in separating a compound of the aforementioned composition. The salt is very hygroscopic, and cannot be dissolved in water without decomposition, a hydrate of peroxide of manganese ($MnO_2,2HO$) being deposited, and sulphuric acid alone remaining in solution. If the yellow liquid is allowed to stand for some time, or better, if it is saturated with sulphate of potassium, a black basic sulphate (MnO_2SO_3) is deposited, and this, upon the addition of sulphuric acid, is reconverted into the original yellow sulphate. The yellow sulphate seems also to be capable of forming crystalline double salts with certain other saline compounds, such as sulphate of potassium, sulphate of manganese, etc. Besides these compounds, several other basic sulphates of peroxide of manganese and an amorphous and a crystalline hydrated peroxide were obtained. Ph. Centr. Halle, Sept. 14th, 1876, p. 322.

FERRUM.

Iron, Preservation from Rust.—Prof. Barff has communicated to the Royal Academy of London a method whereby iron surfaces may be perfectly preserved from rust. To this end the surface is coated with a layer of sesquioxide of iron. This is much harder than the iron itself, and not only increases the resistance of the iron to chemical but also to mechanical action. To produce this coating,

the iron utensil is heated in an appropriate vessel for five hours at a temperature of 260° C. (= 500° F.), by which the surface is oxidized to sesquioxide, and is then thoroughly preserved from rusting. If the heat is continued from six to seven hours at 650° C. (= 1202° F.), the layer of sesquioxide becomes so hard that it can no longer be scratched by a file. The surface of the iron is not changed by the process, except in its color; a smooth surface remaining smooth, while a rough one will remain rough. The discovery bids fair to be applied very extensively in the future. Ph. Centr. H., June 21st, 1877, p. 202.

Monosulphide of Iron.—This compound, which, as is well known, is used for preparing the sulphhydric acid of the laboratories, commands a high price, notwithstanding the cheapness of the material (iron and sulphur). With a view to rendering a ready method available, Dr. C. Méhu recommends the following process: Two parts of finely powdered iron pyrites (bisulphide of iron) and one part of clean iron filings (free from oxide) are intimately mixed, introduced into a Hessian crucible, and heated to redness for half an hour. A gray mass, consisting of unexceptionable monosulphide is thus obtained. It is not necessary to heat to the melting-point. Zeitsch. Œst. Ap. Ver., Sept. 10th, 1876, p. 413.

Protochloride of Iron, Preparation of Solutions of Definite Strength.—Dambier recommends the preparation of solutions of protochloride of iron by dissolving reduced iron in hydrochloric acid of known strength, employing rather an excess of iron. The acid diluted with water is placed in a vessel on the fire, and the iron added in small quantities until effervescence ceases, and then diluting to the proper strength with distilled water. The following table shows the quantities, by weight, of hydrochloric acid of different densities required to form with 4.41 parts of iron, 10 parts of protochloride:

Sp. gr. of acid.	Containing per cent. HCl.	Quantity required.	Containing real HCl.
1.19	38.38	14.96	5.74
1.18	36.36	15.80	5.74
1.17	34.34	16.72	5 74
1.16	32.32	17.77	5.74
1.15	30.30	18.96	5.74
1.14	28.28	20.31	5.74
1.13	26.26	21.87	5.74
1.12	24.24	23.71	5.74
1.11	22.22	25.85	5.74
1.10	20.20	28.44	5.74
1.09	18.18	31.60	5.74

The author points out that the proportions of iron in the protochloride is nearly two and a half times greater than in the protoiodide, a point worthy of the notice of prescribers, the syrup of protochloride of iron having a much more decided styptic taste than the corresponding syrup of protoiodide. Next to the protocarbonate of iron, the protochloride contains the largest percentage of iron, while it possesses the advantage over the protocarbonate in being more readily preserved, and not liable, by prolonged use, to induce constipation. The following table shows the proportion of iron to other constituents in certain ferruginous preparations:

	Iron.	Other constituents.
Protocarbonate of iron,	48.28	51.72
Protochloride of iron,	44.13	55.87
Protoxalate of iron,	38.88	61.12
Hypophosphite of iron,	37.34	62.66
Phosphate of iron,	36.84	63.16
Pyrophosphate of iron,	30.02	69.98
Bromide of iron,	25.93	74.07
Citrate of iron,	22.85	77.15
Tartrate of potassium and iron,	20.96	79.04
Lactate of iron,	19.45	80.55
Iodide of iron,	18.08	81.92
Antimoniate of iron,	13.65	86.35

Ph. J. Trans., July 29th, 1877, p. 103; Bull. Société de Pharm. de Bordeaux.

Ferric Iodide.—R. Rother claims to have discovered this compound. He states that it is a black, highly crystalline, but exceedingly deliquescent salt, which is immediately decomposed by water into ferrous iodide and free iodine. It is extremely soluble in alcohol, chloroform, ether, and bisulphide of carbon. Its alcoholic solution may be boiled protractedly without escape of iodine, but the presence of excess of iodine, or a mere trifle of alcohol, prevents its crystallization. It solidifies in slender confused needles, often forming beautiful stellate tufts. The Pharm., July, 1876, p. 195.

Ferric Phosphate with Citrate of Sodium.—This combination is recommended by J. Martenson, prepared as follows: 358 parts of crystallized phosphate of sodium are dissolved in 10 to 15 times the quantity of hot water, the solution is precipitated by just sufficient ferric chloride (avoiding excess), and the precipitate is carefully washed. It is then transferred to a porcelain capsule, 137 parts of citric acid are added, moderate heat is applied, and the

liquid neutralized with carbonate of sodium; the heat is continued until solution is effected, which is then filtered, and evaporated to dryness. The anhydrous compound contains 25 per cent. of ferric oxide, but is capable of combining with more ferric phosphate, until it has nearly the composition represented by the formula: $2Fe_2O_3 PO_5+3NaO,C_{12}H_5O_{11}$, which requires 28.57 per cent. of ferric oxide. The taste of the solution is slightly saline, and not in the least ferruginous; by the addition of citric acid it becomes agreeably acidulous. A. J. Ph., Oct. 1876, p. 465, from Ph. Zeitsch. f. Russ., No. 10, 1876.

Ferric Citrophosphate.—R. Rother, under this name, recommends a compound of ferric phosphate and ferric citrate as possessing many advantages over the officinal phosphate of iron. It is prepared as follows: To 1 pint of solution of ferric sulphate add 7 troy ounces of crystallized phosphate of sodium, and heat until solution is effected; then in a capacious vessel dissolve 9 troy ounces of bicarbonate of sodium in a half pint of water by the aid of heat, add in rapid succession the ferric solution, one-fourth at a time, maintaining the heat, and stirring constantly until effervescence has ceased; dilute the mixture with water to 1 gallon, allow the precipitate to decant, and repeat this process of washing three or four times, after which collect the precipitate on a strainer, and press. To the precipitate, transferred to a porcelain capsule, add 3 troy ounces of citric acid, heat on a water-bath until solution is effected, pour the solution on glass or porcelain, and expose in the open air to dry. Yield, about $6\frac{1}{2}$ troy ounces. So obtained, it forms beautiful brown-green scales, which possess a sweet acidulous taste, free from metallic taste and the saline nauseousness of some of the ferric double citrates now in use. It will keep permanently in concentrated solution, one-half troy ounce in the fluid ounce being a convenient form. The Pharm., Sept. 1876, pp. 257–259.

CHROMIUM.

Compound of Chromium and Arsenic.—R. H. C. Neville draws attention to a compound of chromium and arsenic, the analysis of which agrees very closely with the formula $CrAsO_3$. It is obtained by pouring a hot and strong solution of pure chromic acid into a hot and saturated (or nearly so) solution of arsenious acid, and keeping the mixture at nearly the boiling-point, until finally a dark-green powder falls. The solution is at first green and transparent,

gradually becomes opaque by reflected but transparent by transmitted light, and eventually deposits the above-named dark-green powder, which is afterwards thoroughly washed. Ch. News, Nov. 24th, 1876, p. 220.

Salts of Chromium, Reactions.—It is well known that chromium salts assume various modifications of color (from green to purple), but hitherto no ready method for accomplishing these modifications has been known, the conversion of the green salts into the violet modification by means of nitric acid requiring more or less time. Etard has now found that nitrite of potassium, as well as the sulphocyanide, produces this conversion rapidly, and that the green oxyhydrate, precipitated from the green chromium salts by potassa, is dissolved in concentrated acetic acid with a violet-red color. On the other hand, the solutions of violet-colored chromium salts are converted into the green modification by the addition of arsenic acid, but the salts so treated cannot again be converted into the violet modification by the agency of alkaline nitrites. Arch. Ph., Sept. 1876, p. 259, from J. de Ph. et de Chim.

Chromate of Iron.—When solution of ferric chloride is added to neutral chromate of potassium, a light orange-yellow precipitate is produced, which, according to R. Kayser, contains, when dried at 40° C. (= 104° F.), 34.58 per cent. ferric oxide and 65.12 per cent. chromic acid, corresponding to the formula $Fe_2O_3 + 3CrO_3$. The compound is insoluble in water, readily soluble in acids, melts when heated to a brown mass, and is not changed by HS. It is therefore a good substitute for and better than chromate of lead as a pigment. Zeitschr. Œst. Apoth. Ver., No. 1, 1877, p. 12.

ZINCUM.

Sulphate of Zinc, Purification.—The purification of this salt is, according to Stolba, rapidly and conveniently effected by means of permanganate of zinc. To the salt, dissolved in three parts of boiling water, some pure zinc white, diffused in water, is added. Permanganate of zinc is then added drop by drop to the boiling solution until a faint red color is produced and is permanent, when all the iron and manganium oxides have been precipitated. The slight excess of permanganate is removed by the addition of a minute quantity of the impure sulphate. The filtrate is rendered faintly acid, to prevent the formation of basic salt, and the purified sulphate is crystallized in the usual way.

Permanganate of zinc, in solution, is obtained by dissolving one part of permanganate of potassium in sufficient hot water, and adding, with continuous stirring, one part of silico-fluoride of zinc. On cooling the mixture artificially, silico-fluoride of potassium separates, and the solution of permanganate of zinc is poured off. A. J. Ph., Feb. 1877, p. 72; Zeitschr. Œst. Apoth. Ver., 1876, p. 555.

PLUMBUM.

Chloride of Lead, Disinfectant Properties.—The London "Lancet" draws attention to the value of chloride of lead as a deodorizer. The manner of its use is to dissolve half a drachm of the nitrate in a pint of boiling water, and pour this solution into a bucket of water, in which two drachms of common salt have been dissolved. After chemical action has taken place, the clear supernatant liquid is an odorless saturated solution of chloride of lead. If this solution be thrown into a sink or vault from time to time, the disagreeable odors will soon be destroyed. A ship's bilge was completely disinfected in this way by simply dissolving half an ounce of nitrate of lead in boiling water, and pouring it into the bilge-water, which itself supplied the necessary chloride of sodium. Cloths wet with the solution, and hung in fever and accident wards of hospitals, are said to keep the atmosphere sweet and healthy. A. J. Ph., Dec. 1876, p. 567; Scient. Amer., Dec. 2d, 1876.

TUNGSTEN.

Silico-tungstic Acid, a New Reagent for Alkaloids.—Dr. R. Godeffroy has found this compound to be an extremely delicate reagent for alkaloids. The new reagent is formed by boiling freshly precipitated silicic acid with pertungstate of sodium solution, and precipitating the solution by an acid. It is soluble in water and in alcohol, and its solutions produce precipitates with the hydrochlorates of the alkaloids. It is so sensitive that $\frac{1}{150000}$ hydrochlorate of atropia, $\frac{1}{5000}$ hydrochlorate of quinia, or $\frac{1}{200000}$ hydrochlorate of cinchonia, afford a distinct reaction. Ph. Centr. H., Dec. 21st, 1876, p. 435.

BISMUTHUM.

Bismuth, Purification.—Thürach has tried the various methods hitherto recommended for the purification of bismuth, but finds them all objectionable, either because insufficient, expensive, or tedious. He recommends as a simple method that the bismuth be

melted under a layer of chlorate of potassium, containing from 2 to 5 per cent. carbonate of sodium, for half an hour, and appears to aim chiefly at the removal of iron and silver, as he does not mention arsenic at all. The latter, it is true, may be removed from bismuth by crystallizing the solution in nitric acid, and using only the crystals.

By the humid method the author obtained the best results by dissolving the metal in the smallest quantity of nitric acid, adding to the solution a slight excess of concentrated solution of oxalic acid, and then diluting largely. The precipitate is allowed to subside, collected on a filter, and washed with cold water. The precipitate is now dried and heated to redness, whereby the oxalate is reduced to metal with evolution of carbonic acid. If oxalate of iron is present, a compound of iron and bismuth is formed, which may be removed from the metal by means of hydrochloric acid. The silver is not completely removed by this process. Schw. Wochenschr. f. Ph., No. 5, 1877, p. 35.

Subnitrate of Bismuth, Presence of Ammonia.—On a recent occasion, W. G. Piper noticed the evolution of ammonia from a sample of subnitrate of bismuth, when triturating it with bicarbonate of sodium and borax. The author details his experiment by which he endeavored to determine the source of the ammonia in this compound (there is no ammonia used in the process of the Br. Ph.), and arrives at the conclusion that most samples of subnitrate of bismuth contain ammonia, and that the ammonia is formed by the action of the bismuth on the nitric acid during solution. Bismuth and nitric acid give nitrate of bismuth, water, ammonia, and nitrogen trioxide. The formation of ammonia during the solution of metals in nitric acid was first noticed in connection with zinc, and has since been found to take place with many other metals. The author, however, appears to be the first to notice its formation in connection with bismuth. Ph. J. Trans., April 21st, 1877, p. 849.

ARSENICUM.

Arsenic, a Ready Test.—Edward Gaillard recommends E. W. Davy's modification of Marsh's test, as the most simple, practical, and, at the same time, certain test for the determination of arsenic or its compounds. The modification consists in the employment of sodium amalgam as a means of generating the hydrogen, thereby avoiding the use of acids. The amalgam found to answer best

for the test consists of one part, by weight, of sodium to eight or ten parts of mercury, and is easily made by heating the mercury, moderately, in a test-tube over a lamp and then gradually adding the sodium in small pieces, taking care to keep the mouth of the tube in such position that accidental spirting, during the addition of the first portion of sodium, may not strike the face. The amalgam, while still hot, is poured out on a clean plate and, when cool, broken up. Sodium is not likely to contain arsenic; mercury very rarely does. In the latter event, the mercury is readily freed from arsenic by digestion with dilute nitric acid, washing with water, and drying. The application of the amalgam to the test is as follows:

Place the suspected matter into a test-tube along with a little water, if necessary; a bit of amalgam, the size of a grain of wheat, is then dropped into the liquid, and the orifice of the tube is immediately covered with a piece of white filtering-paper, or the cover of a porcelain crucible, moistened with a drop of solution of nitrate of silver (20 grains to 1 ounce of distilled water and 2 drops of nitric acid). A dull black or deep brown stain on the paper, or a dark silvery stain on the porcelain, is quickly developed on the moistened part if arsenic in any of its forms is present, owing to the silver salt being reduced by the arsenuretted hydrogen to the metallic state. The only other substance that will produce a similar stain, under the same conditions, is antimony. Antimonuretted hydrogen is, however, not evolved from strong alkaline solutions (except, perhaps, as a mere trace); and, since the presence of alkalies does not interfere with the evolution of arsenical gas, the mixture in the tube may, previous to the addition of the amalgam, be made strongly alkaline. One one-thousandth of a grain of arsenious acid, dissolved in 1 c.c. of water, gives a very decided reaction in a few moments, and even smaller quantities may be detected. The presence of organic matter, milk, tea, coffee, ale, porter, flour, etc., does not seem to interfere with the reaction. A. J. Ph., March, 1877, p. 126.

Arsenic, Determination.—Gautier has determined that the following method for the determination of arsenic, when strictly followed and carefully executed, is rapid and not attended with the slightest loss of arsenic, and that even the presence of large quantities of chlorine compounds do not vitiate the result.

About 100 grams of the suspected substance are covered in a capsule with 30 grams of nitric acid and heated until it becomes

thick and begins to adhere to the sides of the vessel. The capsule is then removed, as otherwise very violent reaction may occur, and a portion of the arsenic volatilized. Six grams of sulphuric acid are now added, the mixture is heated until the black-brown mass begins to adhere to the bottom of the capsule, and 15 grams of nitric acid are then added, drop by drop, to the hot mass. The reaction now becomes tolerably violent, the nitric acid is soon completely vaporized, and a carbonaceous residue is obtained, which may be readily pulverized and yields *all* of the arsenic, that may have been originally contained in the substance, to hot water. Ph. Centr. H., No. 1, 1877, p. 3.

Arsenic, Detection in Salts of the Alkalies.—Commercial salts of the alkalies frequently contain arsenic in the form of arseniate. For the detection of the latter, Patrouillard recommends that the salt be boiled with 4 per cent. of its weight of oxalic acid, whereby the arsenic acid is reduced to arsenious acid, which may then be readily determined by means of sulphhydric acid, etc. He prefers oxalic acid as a reducing agent to sulphurous acid or hyposulphite of sodium, because it is always at hand in a pure condition, and also because the deposition of sulphur, occurring when the latter is used, may lead to errors. Arch. Ph., September, 1876, p. 262, from J. de Ph. et de Chim.

Arsenic, Utilization of Residues of the Anilin Manufacture.—According to Prof. C. Winkler the arsenical liquor is treated with soda to alkaline reaction, evaporated till a pellicle forms, mixed with a certain proportion of limestone (calcic carbonate) and coal in powder, dried, and then heated to redness in a muffle roasting oven, collecting the arsenic vapor by suitable means. Ph. Centr. H., Sept. 14th, 1876.

ANTIMONIUM.

Native Sulphide of Antimony.—Wm. C. Sheffield has subjected eleven samples of black sulphide of antimony, purchased at as many different retail drug stores, to analysis, with the following results:

100 parts sample.	1	2	3	4	5	6	7	8	9	10	11
Antimonious sulphide,	31.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Very nearly pure antimonious sulphide, with a trace of arsenic.
Arsenious sulphide, .	6.6	1.2	trace	4.2	1.2	0.0	0.0	0.0	0.0	0.0	
Carbon, as charcoal, .	8.9	16.5	12.5	34.7	55.5	11.7	45.6	20.0	28.4	60.6	
Silicious matter, . . .	17.2	73.5	67.5	7.0	37.5	79.3	9.0	77.5	33.8	14.3	
Ferrous sulphide, . .	2.5	1.5	4.4	6.2	2.3	7.5	1.1	1.1	4.6	1.6	
Calcium carbonate, . .	22.0	3.5	5.5	22.0	1.1	0.0	26.6	0.0	20.9	14.2	
Magnesium as sulphate,	7.5	1.6	3.7	22.8	0.9	0.0	13.5	0.0	10 3	6.6	
Total, . .	96.2	97.8	93.6	96.9	98.5	98.5	95.8	98.6	98.0	97.3	

A. J. Ph., September, 1876, p. 389.

HYDRARGYRUM.

Hydrargyrum Sulphuratum Nigrum.—E. Dannenby recommends its preparation by simple agitation of the mercury and sulphur, as rapid and convenient; two hours being necessary when operating with half a pound. A larger quantity is inconvenient. The sulphur as well as the bottle, which should be half filled by the mixture, must be perfectly dry. Arch. Ph., Sept. 1876, p. 257.

ARGENTUM.

Silver, New Volumetric Determination.—Volhard recommends alkaline sulphocyanides (ammonium or potassium) for the volumetric determination of silver salts in acid solutions, using ferric sulphate as indicator. A few drops of solution of ferric sulphate are added to the silver solution, and the sulphocyanide is then allowed to flow in. Upon each addition of the latter a red cloud of sulphocyanide of iron is formed but disappears again very rapidly, a curdy-white precipitate of sulphocyanide of silver being formed. Finally the red color of sulphocyanide of iron is permanent and the process is ended. Owing to the intense color of the latter, the method is extremely delicate.

The method is available for general purposes, since, indirectly, many other bodies—such as chlorine, bromine, iodine, etc.—may be very rapidly determined. Their acid solutions are treated with solution of silver in excess, and such excess is readily determined as above. Ph. Centr. H., Feb. 28th, 1876, p. 341.

Silver, Recovery from Solution, etc.—E. Von Bibra has examined the various methods proposed, and recommends to precipitate the solutions with sulphuric acid, ignite the precipitate, digest with

nitric acid, and precipitate by hydrochloric acid. The precipitated chloride of silver is treated by Græger's process by adding ammonia and digesting with zinc. The grayish or whitish precipitate gradually becomes deep gray (almost black), and then contains zinc, which is extracted by dilute sulphuric acid, or better by boiling with dilute hydrochloric acid, when pure silver is left behind. A. J. Ph., Dec. 1876; J. Prakt. Ch., 1876, 185–192.

Fulminate of Silver.—Rud. Boettger recommends the following method for preparing without danger this compound for experimental purposes: Several grams of finely powdered nitrate of silver are dissolved in a capacious porcelain capsule, in very dilute nitric acid, by the aid of gentle heat. When the solution has cooled completely, a little concentrated and fuming nitric acid is added, followed by anhydrous alcohol in small portions. The contents of the capsule almost immediately begin to simmer gently, with evolution of nitrous ether vapor; if the mixture should boil violently it is moderated by the further addition of alcohol, after which it is allowed to stand until the simmering ceases entirely. The capsule is now filled with cold water, carefully avoiding all attrition; the snow-white precipitate is collected on a filter, washed by the aid of a spritz-bottle, and is then divided, while still moist, into small heaps about the size of a pea, on double layers of filtering-paper. Ph. Centr. H., Nov. 30th, 1876, p. 412.

NEW METALS.

A New Metal, Alleged Discovery.—From a communication made to the Société des Sciences Physiques et Naturelles de Bordeaux, it appears that M. Prat has discovered a new metal, which, in honor of Lavoisier, he calls

Lavœsium.—This new metal is of a silvery-white color, malleable and fusible. It forms crystallizable and colorless salts. The following are some of its reactions: When treated with potassa a hydrated white precipitate is obtained, insoluble in excess of the precipitant. Ammonia gives a precipitate very soluble in excess. Ferrocyanide of potassium gives a characteristic precipitate, similar in color to that of the petals of *roses du Bengale.* With hydrosulphuric acid a brown coloration is obtained; the precipitate afterwards changes to a fawn color. Tannin produces a deep yellow-green precipitate. In the spectroscope the new metal gives: 1. In the indigo blue, two sets of characteristic lines. 2. In the

bright green, two other sets of simpler lines, also characteristic. 3. Some blue, violet, and green secondary lines; in all, twenty-three lines. These characteristic lines exactly coincide with those of copper. Its silvery-white color, however, and some of its reactions, especially those with ammonia and ferrocyanide of potassium, constitute properties which distinguish it from any other known metal. According to M. Prat, this body is much more common than he at first supposed, it having been found in many minerals, and especially in iron pyrites. If lavœsium really exists, its therapeutic action and its industrial uses remain to be studied. Chem. News, April 6th, 1877, p. 137.

Neptunium, a New Metal.—K. Hermann has obtained from columbite small quantities of a new metal, which appears to belong to the Tantalum group of metals, occupying in this group the second position as regards its atomic weight: Tantalum, 176; *neptunium*, 118; niobium, 114.2, and ilmenium, 104.6. The hydrates of the metallic acids of this group are not dissolved by the mineral acids, with the single exception of fluoric acid, whose solutions of neptunium are not precipitated by HS. Fluorneptunium forms, when boiled with hydrate of sodium, a precipitate which is insoluble in pure boiling water. With fluoride of potassium it forms a readily soluble double compound. Neptunic acid forms, with phosphoric salt, when treated in the inner blowpipe flame, a wine-yellow bead; neptunate of sodium, under the same circumstances, a golden-yellow bead. The bead of tantalic acid is colorless; of niobic acid, blue, and of ilmenic acid, brown. The solutions of the sodium salts of the acids of this group give the following distinctive precipitates with tincture of galls: Tantalum, sulphur-yellow; niobium, orange; ilmenium, brick-red; neptunium, cinnamon-brown. Ph. Central H., June 7th, 1877, p. 186.

Gallium, Physical Properties.—Lecoq de Boisbaudran, in a recent note to the French Academy of Sciences, states that he has prepared about $7\frac{1}{2}$ grains of gallium. In the liquid state the metal is beautiful silvery-white, but in crystallizing it turns blue and its brilliancy becomes diminished. The point of fusion is fixed, for the metal melts very slowly at 86.27° F. and crystallizes very slowly at 86.09° F. The density of the specimen is 5.935. Gallium crystallized under water crepitates sometimes on heating. A. J. Ph., Dec. 1876, p. 565; Scient. Amer., Nov. 11th, 1876.

ORGANIC CHEMISTRY.

HYDROCARBONS.

Pittacal.—This substance has not been observed since Reichenbach discovered it, about forty years ago, until Grätzel recently again obtained it from the fractions of wood-tar having a high boiling-point. Liebermann separated from it orange-colored needles, which he names

Eupitton.—These crystals dissolve in alcohol and acetic acid with a brown, in ammonia with a blue, and in alkalies with a purple color; carbonic acid or the addition of saline solutions cause blue precipitates, which are soluble in pure water, the precipitates by calcium, magnesium, barium, and tin salts usually having a beautiful gold lustre. The lead precipitate dissolves in concentrated sulphuric acid with a red color, which changes to blue on warming. A. J. Ph., July, 1876, p. 329, from Ber. d. Chem. Ges., 1876.

Naphthalin, Artificial Production from Oil of Turpentine.—By passing turpentine through a red-hot tube, G. Schulz observed that much carbon was separated, and hydrogen evolved, the distillates containing several hydrocarbons. On redistilling the product, the portion obtained between 230° and 232° C. (= 446° and 449.6° F.) congealed, and, after filtering, and pressing between bibulous paper, yielded naphthalin, which crystallized from alcohol, fused at 30° C. (= 86° F.), boiled at 217° C. (= 422.6° F.), and furnished, with picric acid, a compound crystallizing in yellow needles and fusing at 149° C. (= 300.2° F.). A. J. Ph., July, 1876, p. 329, from Ber. d. Chem. Ges., 1876.

Benzol and Benzin.—Von Heeren reviews the history and sources of these hydrocarbons, which are frequently confounded, not alone with each other, but also with the more volatile products of petroleum. He suggests that the name "benzol" should be retained and applied only to the perfectly pure product obtained by the distillation of benzoic acid and lime, or from coal-tar, while the name "benzin" should be used to the impure varieties of the same liquid having a constant boiling point. The name benzin should never be applied to one or more of the more volatile products of petroleum, the names petroleum-ether, naphtha, gasolin, ligroin, etc., being sufficient and more applicable. The names "benzol"

and "benzin" are equally inapplicable to the more volatile products of the distillation of the tars of cannel, boghead, or brown coal, which are more properly designated by their commercial names, such as photogen, mineral oil, hydrocarburet, slate oil, or eupion. These, as well as the petroleum products, are distinguished from the true benzol or benzin in being insoluble in alcohol and in burning with but little smoke. Zeitschr. Œst. Ap. Ver., No. 12, 1877, p. 189.

Mineral Oils, their Purification and Use in Pharmacy.—Masson finds that mineral oils may be deodorized so as to fit them for pharmaceutical and other uses. The process is cheap and simple, and consists in treating them with:

Alcohol (95°), ...	500 parts,
Sulphuric acid.	60 "
Nitric acid, ...	60 "

per 100,000 parts petroleum oil. The acids are first introduced separately, by means of a funnel with a long tube reaching nearly to the bottom of the vessel. The spirit is then poured on the surface of the oil, and precipitates slowly, uniting with the acids. Heat and slight effervescence are thus set up, producing the distillation of a small quantity of nitrate of ethyl. The new products have a very agreeable smell, and the substances so treated take a yellowish tinge, and have also an agreeable odor. The operation takes about an hour, after which the oil should be well agitated and washed with water, and allowed to stand for eight or ten hours. The surface liquor, which is deodorized petroleum, is then decanted, leaving behind a mixture of acids, water, and alcohol. This may be used for deodorizing of what are known as fatty oils. In pharmacy, the author has found petroleum, purified and deodorized as above, an excellent substitute for rectified spirit. Various tinctures for external use, camphorated, etherized, and chloroform solutions so prepared, answer as well as with an alcoholic base. New Rem., March, 1877, p. 78; Amer. Jour. Phar., 1877, p. 242.

Petroleum, Test for Sulphur.—The presence of sulphur in petroleum has the effect of producing vapors during combustion, which may seriously affect the eyes and organs of respiration. Hence a ready test for its detection in illuminating oil is desirable. Dr. Vohl recommends for this purpese a fragment of sodium the size of a pin's head, which is boiled for some time with petroleum contained in a test-tube. In the presence of sulphur the bright sur-

face of the metal becomes coated with a yellowish film ; after cooling a few drops of water are added, followed, after a time, by solution of nitroprusside of sodium, when the entire liquid will immediately assume a magnificent violet-blue color. If no coloration occurs, the oil is completely free from sulphur.

Hager suggests the substitution of mercury for sodium, and simple agitation instead of boiling. Ph. Centr. H., Sept. 7th, 1876, p. 305.

Petroleum Benzin, Pharmaceutic Utility.—L. Wolff draws attention to some useful applications of petroleum benzin in pharmacy. It has been frequently proposed, with a view of substituting the higher priced ether in the preparation of oleoresins, for which, however, it appears to be totally unsuited, since it possesses the power to dissolve fatty matter, wax, and volatile oils, but fails to extract many resinous and other matters to which the oleoresins owe mainly, or in part, their activity. On the other hand, its power to dissolve volatile oils, fatty matters, and certain other substances, renders it a very useful agent for isolating these, or, when these interfere with the proper extraction of the drug, for removing these. Attention is drawn, in the author's paper, to the practical application of this solvent in the preparation of *volatile oils*, *apiol*, *extract of nux vomica* (the removal of the fixed oil), and *pure oleic acid*, which see elsewhere in this report. A. J. Ph., Jan. 1877, p. 1 to 4.

VOLATILE OILS.

Volatile Oils, New Method of Preparation.—L. Wolff finds that petroleum benzin serves an excellent purpose for preparing volatile oils from many crude substances containing them, such as cinnamon, cloves, etc. The petroleum benzin will dissolve only the volatile oil and any fatty matter which was associated with it. To separate these, the oily product, remaining after the evaporation of the petroleum benzin, is treated with alcohol, which dissolves the volatile oil to the exclusion of the impurities; the alcoholic solution is then mixed with several times its volume of water, by which the oil is readily separated, and will rise to the surface or subside, according to its specific gravity. The aroma of the volatile oils is, in many cases, superior to that of volatile oils obtained by the ordinary methods, while the process is easily carried out with small or large quantities of material, and is at the same time economical. A. J. Ph., Jan. 1877, p. 1.

Essential oils frequently have a dark color; this is particularly the case with oil of wintergreen. To remove the color, L. C. Hogan recommends that the oil be shaken with a few grains of tartaric acid. The decoloration is instantaneous. The Pharm., October, 1876, p. 290.

Oil of Lemon.—E. Dannenberg has observed that the white or yellowish-white precipitate so frequently observed in oil of lemon (and in oil of bergamot) contains lead. The lead seems to be combined with a peculiar acid, which the author will endeavor to determine, as soon as he can collect sufficient of the precipitate. When the latter is suspended in water, and treated with hydrosulphuric acid, an acid liquid is produced which, when neutralized with ammonia, does not affect solution of nitrate of silver, but reduces the silver upon boiling. It produces a copious white precipitate with acetate of lead, and a scanty white precipitate with chloride of barium. Arch. Ph., Sept. 1876, p. 258.

Volatile Oil of Cinnamon Leaves.—N. A. Kuhn has had opportunity to examine oil of cinnamon leaves, which he describes as follows: Its taste is sharp and biting; its odor reminds at first of nutmeg and then strongly of cloves, but if heated with caustic potassa, the odor of cinnamon is predominant. The color is that of true oil of cinnamon, and it is heavier than water. The author's experiments indicate the presence of cinnamic and eugenic acids. A. J. Ph., Jan. 1877, p. 12.

Safrol.—As early as 1738 John Maud had noticed the formation of a crystalline stearopten, which had formed in *oil of sassafras* when exposed to the cold, and in his report to the Royal Society he mentions crystals four inches long and heavier than water. The same crystals were examined by St. Evre, in 1844, under the name of *sassafras camphor*, who found this to have the composition of $C_{10}H_{10}O_2$, and a sp. gr. of 1245 at 6° C. (= 42.8° F.). Its melting-point was found to be between 5° and 17° C. (= 41° and 62.6° F.), its boiling-point at 232° C. (= 449.6° F.), and its congealing-point at about 7.5° C. (= 45.5° F.). Grimaux and Ruotte, in 1869, also experimented upon oil of sassafras, and obtained by fractional distillation a liquid which corresponded in its composition and general character with the sassafras camphor of St. Evre, but which failed to crystallize even at a temperature of —20° C. (= —40° F.). This liquid they named "safrol," which along with a hydrocarbon, "safren," mainly composes oil of sassafras. Besides these,

the oil of sassafras contains a small proportion of a phenol-like body, which appears not to have been further investigated. Arzruni has now made experiments with a view of determining whether or not the "sassafras camphor" of St. Evre and the "safrol" of G. and R. are identical, as seemed to him probable, and his experiments fully confirm his expectations. On exposing some oil of sassafras to 0° C. (= 32° F.) for some time, the entire oil congealed to a crystalline mass, from which a small quantity of yellowish oil could be drained. The crystals being imperfect in form, the author again melted them, exposing them during a short time to a temperature of perhaps 70° C. (= 158° F.). Upon now exposing them to a temperature of 0° C. (= 32° F.), and a portion of the time to —12° C. (= 10.4° F.), the liquid failed to congeal. Subsequently, after the author had given up the endeavor to obtain crystals, the safrol, however, again crystallized at a temperature a little below 0° C. (= 32° F.), and he afterwards had no difficulty to again obtain crystals, if he was careful to melt the safrol at a temperature not above 20° C. (= 68° F.). In continuation of his experiments he was now able to secure perfectly formed crystals, some of which were 1 decimetre in length by 3 centimetres in diameter. These crystals are tolerably hard at 0° C.; they melt, if not too large, at 8.5° C. (= 47.3° F.), but the largest require a temperature of 10.5° C. (= 50.9° F.) before they will melt. The crystals were colorless, strongly refractive, and belong to the monosymmetric system. N. Rep. Ph., No. 10, 1876, p. 615.

Monobromated Camphor.—T. C. Linthicum has made comparative experiments to determine the value of the processes for the preparation of monobromated camphor, as recommended by J. M. Maisch (1872), J. U. Lloyd (1875), and E. Dubois (1875). He was unable to obtain crystals by the process of Dubois; by the process of Lloyd, which directs a little over one equivalent of bromine, he obtained some crystals; while the process of Maisch, which directs the use of two atoms of bromine, is satisfactory. The author is satisfied, from his experiments, that the process works best with two atoms of bromine, and a temperature not below 132° C. (= 269.6° F.). A. J. Ph., Aug. 1876, p. 346.

Thymic Acid ($C_{10}H_{14}O$).—The following formula is reported for adoption by a committee on "Standard Formulas" to the Société de Pharmacie of Paris: Add an aqueous solution of potassa or soda (1 : 10) to oil of thyme, and agitate repeatedly to facilitate

combination. Thymic acid or thymol enters into solution, while thymene, the accompanying hydrocarbon, remains unacted on. The solution is filtered, and decomposed by an acid (*e. g.*, hydrochloric), which liberates thymic acid. The crude acid is washed with water, and, after drying, distilled. So obtained, thymic acid is liquid, but may be obtained in crystals by exposing it some time to the cold. It is but little soluble in water, but very soluble in alcohol. It is strongly caustic. New Rem., April, 1877, p. 125, from Rép. de Pharm., Nos. 2 and 3, 1877.

Oil of Bitter Almonds, Artificial.—E. Lippmann and Joseph Hawliczek have examined artificial oil of bitter almonds, prepared from toluol, by Wilhelmi, of Leipzig, and compared it with true oil of bitter almonds, which had been freed from hydrocyanic acid by distillation with milk of lime and ferrous sulphate; the artificial and natural oil were found to be identical, chemically as well as physically. They boiled between 178° and 180° C. (= 352.4° and 356° F.); the chloride of benzyliden, prepared from both, had the same boiling-point and the same elementary composition; the benzoic acid prepared from both, by three different processes, had the fusing-point and other properties of ordinary benzoic acid, and various ethers obtained from the two were identical. The specific gravity of the artificial oil at 0° C. (= 32° F.) was found to be 1.067, which agrees with the density (1.063) of the benzyaldehyd from the natural oil, determined by H. Kopp. A. J. Ph., Feb. 1876, p. 69; Ber. Chem. Ges., 1876, p. 1461.

Sulphocyanide of Allyl.—The observation of Gerlich that sulphocyanide of allyl, when heated to a certain temperature, assumes all the characters of volatile oil of mustard, while the compound, prepared at a low temperature, 0° C. (= 32° F.), is free from all pungency, and possesses distinctive characters (see Proceedings, 1876, p. 295), has induced E. Schmidt to experiment in order to determine whether, at a low temperature, sulphocyanide of allyl is also formed by the action of myrosin or myronate of potassium. Operating with perfectly pure myronate of potassium, he found that at a temperature of 0° C. (= 32° F.) volatile oil of mustard was formed, but that at the same time small quantities of sulphocyanide of allyl were also produced, as evidenced by the characteristic sulphocyanide reaction obtained on the addition of ferric chloride, which pure volatile oil of mustard does not give under any circumstances. Schweiz. Wochensch. f Ph., June 15th, 1877, p. 187.

Artificial Mustard Oil.—The introduction of artificial oil of mustard appears to meet with a drawback, in that its odor differs very materially from that of true oil, and is quite disagreeable, and consumers in Germany have consequently declined to purchase it in place of true oil. E. Mylius has examined the commercial oil, and finds it to be composed, in 1000 parts, as follows: Pure allyl mustard oil, 922.0; hydrocyanic acid, 0.2; bisulphide of carbon, 8.0; polysulphide (probably trisulphide) of allyl, 40.0; and undecomposed, non-volatile, nitrogenous sulphur compounds, 30.0 parts. Not reflecting upon the presence of the small proportion of hydrocyanic acid and of bisulphide of carbon, the chief objection lies in the presence of the polysulphides, which communicate to the product such disagreeable odor that its application in medicine is rejected with justice. Manufacturers should therefore endeavor to remove these objectionable complaints, when the artificial oil will perhaps be preferred to the true oil, not only on account of being cheaper, but also because it contains a much larger proportion of active allyl mustard oil. Arch. Ph., March, 1877, p. 207.

ALCOHOLS, ETHERS, ETC.

Alcohol, Tests for its Presence in Urine.—F. C. Hewett calls attention to the fallacy of Anstie's bichromate of potassium test for alcohol in urine, unless the latter be first distilled, the fallacy consisting in the reduction into the green oxide, not by alcohol singly, but by some agent present in the urine of persons who are total abstainers from alcohol. If the test be applied to the distillate, in the case of alcohol having been taken in sufficient quantity to permit of its excretion in an unchanged form, the test will hold good, but not otherwise. The same objection exists to the molybdic acid test, proposed at the Irish Royal Society meeting during the week ending May 27th, by Dr. Davy. When applied to the urine of persons, abstainers or otherwise, a purple coloration was produced, and the intensity of the coloration appeared to bear no relation to the fact of indulgence, but was most intense in the urine of the greater specific gravity in either case; but the urine of those who had recently partaken of alcohol could be distinguished by the diagnostic reaction on the addition of the test to the distillate. Alcohol is the only substance present in the distillate that gave the reaction. The test fluid is made by dissolving one part by weight of molybdic acid in two parts of strong sulphuric acid by the aid

of heat. A drop of this, added to a solution containing alcohol, instantly produces a blue coloration. New Rem., Aug. 1876, p. 237, from Br. Med. Jour.

Bromide of Ethyl.—At a recent meeting of the Academy of Sciences, M. Rabuteau gave some details of an investigation of the physiological properties and mode of elimination of bromide of ethyl, from which it appears that he considers it to be an anæsthetic agent possessing properties intermediate between those of chloroform, bromoform, and ether. It is eliminated nearly entirely, if not completely, by the respiratory passages, whatever may have been the mode of its absorption.

Bromide of ethyl (C_4H_5Br), or "hydrobromic ether," is a colorless liquid with an agreeable odor; it boils at about 40° C. (= 104° F.), has a density of 1.43, and burns with difficulty. It produces absolute anæsthesia as rapidly, or even more rapidly, than chloroform. This result has been established with frogs, rabbits, dogs, etc. After five minutes', sometimes after two minutes', inhalation, by means of a sponge saturated in bromide of ethyl, dogs are completely anæsthetized. The animal recovers more rapidly than when chloroform is used. Ph. J. Trans., Feb. 3d, 1877, p. 631.

Iodoform, Method of Preparation.—The following method for the preparation of this compound is given in "New Remedies," June, 1877, p. 189: Carbonate of potassium (pure), 2 parts; alcohol, 84 per cent., 5 parts; distilled water, 15 parts; iodine, q. s. Introduce 2 parts of iodine and the other ingredients into a flask, and heat the mixture until it is colorless; now add one-half part more iodine, heat as before, and repeat this with further small quantities of iodine until the liquid retains a brownish tint. This is decolorized by the addition of one or two drops of caustic potassa, when, upon applying cold, crystals of iodoform are separated. They are collected on a filter, slightly washed with distilled water, dried on blotting-paper, and placed in well-closed vials. On evaporating the mother water, a large quantity of iodide of potassium is produced. (From Rép. de Pharm.?)

Chloral Hydrate, Test for Hydrochloric Acid.—C. Anderson criticizes the statement "that free hydrochloric acid is indicated by the formation of white fumes on approaching a glass rod moistened with ammonia." Such a test is no proof of the presence of hydrochloric acid, since the vapor of chloral hydrate, even when perfectly pure, will always produce white fumes when brought in

contact with ammonia. In the presence of hydrochloric acid, chloral hydrate will produce the characteristic precipitate with nitrate of silver; but its presence should be confirmed by the following reaction: Add to the solution of chloral a solution of sulphide of sodium. If the chloral is pure the mixture turns yellow, then becomes cloudy and gradually darker in color, changing to rose or brick-red, according to the quantities of the ingredients, but always to the last-named tint if heated. If the chloral is contaminated with hydrochloric acid, however, the same reagent, under the same circumstances, produces a deposit of sulphur and a disengagement of sulphuretted hydrogen.

Chloral hydrate is volatile at ordinary temperatures, like iodine and camphor. It may be considered pure if it has no acid—or at least only a very faintly acid—reaction upon moistened litmus-paper, does not stain paper, is not affected by nitrate of silver, gives off no reddish vapors with nitric acid, and yields 72.2 per cent. of chloroform when decomposed by caustic potassa. New Rem., Feb. 1877, p. 45, from J. de Ph. d'Anvers.

Chloral Hydrate, Union with Camphor.—E. C. Saunders has endeavored, by experiments, to determine whether the well-known phenomenon of liquefaction, resulting when equal parts of chloral hydrate and camphor are mixed, is due to chemical combination, or to the solvent power of one article over the other. As a result of his experiments, he finds that the action is not one of chemical combination at ordinary temperatures, but of solution, and that the camphor acts in all probability as the solvent; but when the mixture is subjected to strong heat, the change of color on the formation of the oily fluid seems to point to chemical combination. The author has observed the following solutions of the mixture to solvents: It is miscible in all proportions with alcohol, sp. gr. 0.838, bisulphide of carbon, ether, and olive oil. It is soluble in eleven parts of alcohol, sp. gr. 0.937. It is insoluble in water. It forms a clear mixture with one and a half parts of chloroform, but a further addition of three parts of chloroform renders it turbid. Camphor forms a permanent liquid with three parts of chloral hydrate. The experiments were conducted with the atmosphere at a temperature of 80° F., a condition which may have influenced the solubility slightly. Ph. J. Trans., July 20th, 1876, p. 89.

Methylic Ether (C_2H_6O).—The usual method of its preparation consists in heating equal parts of pure methylic alcohol and con-

centrated sulphuric acid in a retort over a moderate fire, whereby, besides methylic ether, carbonic acid, sulphurous acid, and empyreumatic matters are formed. Tellier has found it advantageous to employ a larger proportion of methylic alcohol, which should be as nearly as possible free from water; the mixture of the methylic alcohol with the conc. acid should have a gravity of 34° B. The condensing facilities should be such that the undecomposed alcohol may be condensed first; while the ether vapor, passing through a solution of caustic potassa or water, or saccharate of lime, for the removal of carbonic and sulphurous acids, and through a vessel filled with chloride of calcium for drying, finally passes, by the aid of a compression pump, into a condenser, in which it assumes liquid form. It is then preserved in strong metallic vessels. It is important that the heat be carefully regulated, the proper temperature lying between 125° and 128° C. (257° and 262.4° F.). When heated to above 130° C. (= 266° F.) the formation of methylic ether ceases, and much carbonaceous matter and sulphurous and carbonic acids are formed. The author has endeavored to make the process continuous, after the manner of making ethylic ether, by allowing methylic alcohol to flow into the heated acid mixture, but finds that etherification soon ceases. The plan which he has adopted, and which secures the conversion of large quantities of methylic alcohol into ether with a fixed quantity of acid, consists in heating the properly prepared mixture until all the ether has distilled, then to allow the mixture to cool (when it will have a gravity of 45° B. and will be composed of about equal *volumes* of acid and alcohol), and then to add a fresh quantity of methylic alcohol until the mixture is again reduced to 34° B., when, upon heating as before, it will again yield methylic alcohol; and this may be repeated several times. Arch. Ph., Jan. 1877, p. 57, from J. de Ph. et de Chim.

Phenol, Production of Coloring-matter.—C. Reichl has found, that when a mixture of 3 p. sulphuric acid and 2 p. each of phenol and glycerin are kept for some time at a temperature of 120° to 130° C. (= 248° to 266° F.), it will gradually turn to a dark-red color, and, on being dissolved in water, hydrochloric acid will precipitate a dark-brown powder, which is sparingly soluble in ether, and not crystallizable from its alcoholic or aqueous solution. Alkalies and alkaline salts color it handsomely red; baryta, alumina, and oxide of lead unite with it to form lakes. When heated with anilin a red color is produced. It dyes silk and wool. Thymol

and pyrogallic acid yield coloring-matters like phenol. A. J. Ph., Feb. 1876, p. 68; Ber. Chem. Ges., 1876, p. 1429.

Phenylsulphate of Potassium.—E. Baumann has obtained this salt from human urine, of which it is a normal constituent. It is readily prepared, synthetically, by boiling, for some time, powdered pyrosulphate of potassium with a concentrated aqueous solution of phenol potassium, adding some alcohol and filtering while hot; on cooling, shining scales of the salt are obtained, which, after washing with alcohol, are nearly pure. The formation of the salt is explained by the equation: $C_6H_5KO + K_2S_2O_7 = C_6H_5KSO_4 + K_2SO_4$.

Cresylsulphate of potassium, which is a normal constituent of the urine of the horse, may be obtained by a similar reaction of cresol potassium. *Resorcin* also behaves to pyrosulphate of potassium like cresol and phenol. The resorcin compound is very readily soluble, and has not been obtained in crystals. A. J. Ph., April, 1877, p. 175; Ber. Chem. Ges., 1876, p. 1715.

Beech Tar Creasote, Distinction from Coal Tar Creasote.—Prof. R. Böttger recommends the following ready method for distinguishing beech tar creasote from phenol: 1 drop of the tar product is dissolved in 40 c.c. of distilled water by agitation, and is then treated with a few drops of concentrated solution of ferric chloride; if, on standing a few minutes, a dirty brownish-yellow color is produced, the tar product is the beech tar creasote of Reichenbach; if, on the contrary, a very faint bluish-violet tint is formed, the substance under examination is phenol. Ph. Centr. H., Aug. 17th, 1876, p. 284.

Glycerin, Fermentation.—A. Fitz observes that glycerin is not fermentable under the influence of the fungi of alcoholic ferments (*Mucor racemosus*); but when sufficiently diluted with water (20 p.) and left in contact with *schizomycetes* and in the presence of calcium carbonate, it undergoes fermentation, normal butylic alcohol and butyric acid being produced, besides small quantities of ethylic alcohol and a volatile fatty acid, probably capronic; hydrogen and carbonic acid are given off during the fermentation. A. J. Ph., Feb. 1877, p. 71; Ber. Chem. Ges., 1876, p. 1348.

Glycerin and Nitroglycerin, Volatility at Ordinary Temperature.—Hess has recently drawn attention to the apparent volatility of nitroglycerin at ordinary temperatures, basing his observation on the fact that a portion of dynamite, which in 1871 contained

72.98 per cent. of nitroglycerin, contained five years afterwards only 69.36 per cent. Hager, commenting on this, draws attention to the fact that he had, in 1875, observed the slow vaporization of glycerin when it is exposed in a thin layer or when mixed with a loose pulverulent body and exposed to dry air. Ph. Centr. H., No. 12, 1877, p. 89.

Nitroglycerin.—R. Böttger gives the following method for preparing nitroglycerin in small quantities for experimental purposes, etc., which is free from danger. A few grams of anhydrous and perfectly pure glycerin are introduced into a test-tube which contains a mixture of 1 volume of nitric acid, sp. gr. 1.52, and 2 volumes of sulphuric acid, sp. gr. 1.84, and which has been thoroughly chilled and is kept surrounded by a freezing mixture. The mixture is then as rapidly as possible poured into a large quantity of cold water, and the oily drops of nitroglycerin separating are thoroughly washed by decantation with water, and finally with a little weak solution of soda. After drying it with a few fragments of fused chloride of calcium, it may be preserved, without fear of change, for a long time. Ph. Centr. H., Nov. 30th, 1876, p. 412.

FIXED OILS.

Fixed Oils, Application of the Spectroscope to the Detection of Adulterations.—W. Gilmour has continued his experiments upon the spectra of fixed oils (see Proceedings, 1876, p. 301), this time particularly with olive oils. While far from conclusive, his results are very encouraging, and are probably destined to afford a ready means for the detection of adulteration as well as quality of certain oils. See Pharm. J. Trans., July 8th, 1876, p. 22, and August 5th, 1876, p. 110.

Sperm Oil, Test for Purity.—W. Gilmour has found that when sperm oil is treated with sulphuric acid in a certain manner, a certain quantity of cetin will separate, and he believes that this circumstance can be applied to the determination of its purity. The mode of procedure is very simple. One part, by weight, of sulphuric acid, sp. gr. 1.84, is thoroughly mixed with four parts of oil; the mixture is agitated once or twice during about twenty minutes, and three ounces (parts ?) of distilled water added. On now shaking the mixture a very thick saponaceous-like compound will be formed, which should be throughout of uniform color, showing that the mixture is complete. After letting it stand for

about eight hours it will be found to have separated into two layers, the one underneath being clear and colorless, and the one above a dark-brown viscous mass, in which the cetin, if present, will be found floating, giving it a mottled appearance. It should now be set aside for a further interval of eight or twelve hours, so that all the cetin may separate, after which it should be transferred to a larger vessel containing three or four times its volume of water, and the whole thoroughly shaken. The cetin will now be found floating on the surface of the liquid, and should be filtered out and thoroughly washed until the filtrate ceases to pass milky, and then dried spontaneously. As thus obtained, the cetin is light, crystalline, pearl-white, not unlike quinine in appearance, but more glistening, and has neither taste nor smell. In the samples of pure oil which he has examined he has obtained about 4 per cent., and from this downwards in the oils which he believes to have been adulterated as evidenced by their specific gravities, etc. The author wishes it to be understood that he does not regard his experiments to be conclusive, and invites further researches in order to carry the matter to a proper conclusion. Ph. J. Trans., Oct. 21st, 1876, p. 329.

Oleum Theobromæ.—Edward Lamhofer has experimented with a view of determining a reliable method for detecting adulterations in commercial cacao butter. He prepared for this purpose the oil from various commercial samples of cacao, by extraction with petroleum benzin, obtaining results which have been tabulated as follows:

Variety of Cacao.	Guayaquil.	Caracas.	San Blas.	Balli.
Yield of oil,	46 per ct.	38 per ct.	45 per ct.	51 per ct.
Melting-point,	91° F.	91.5° F.	90° F.	89.5° F.

Commercial samples of cacao butter were found to have a melting-point of 90° and 91.5° F.; the melting-point of oil from Caracas cacoa was not reduced by an addition of 5 per cent. of mutton suet, was reduced to 91° F. by 5 per cent. of beef suet, and to 85° F. by 20 per cent. of the same suet. On the whole, he does not consider that the melting-point of the oil can be relied on as a criterion of freedom from adulterations; at least to the amount of 5–10 per cent., which, while as large as it is likely to be used as an adulterant, does not materially lower the melting-point. As a result of his experiments, he considers the following methods sufficient to indicate the purity or adulteration of the oil:

1. Pure cacao oil dissolves entirely in ether or benzin, separating out in minute granular crystals when immersed in water of 32° F., the liquid portion remaining transparent until, after thirty or forty minutes, the whole of it is solidified.

2. When, after solidification, the oil is left to remain at a temperature of about 58° F., it will redissolve, forming a transparent solution.

Adulterations with animal fat are indicated:

1. By the cloudy appearance of the solution which follows after immersing in water of 32° F.

2. By the slow and incomplete congealment of the oil when subjected to the test with petroleum benzin.

The amount of sophistication is shown:

1. By the more or less intense cloudiness, and by the slow or rapid formation of it with the above test. Largely adulterated oils congeal almost instantly, while the turbidity of a solution with 2 per cent. of stearin becomes visible only after two minutes.

2. By the more or less complete congealment of the oil when treated with petroleum benzin.

3. By the more or less intense cloudiness of a congealed solution when left for twenty-four hours at 58° F. If largely adulterated, the mixture will not become liquid at all at that temperature. A. J. Ph., May, 1877, p. 237.

Vegetable Wax, Distinction between that of Ceroxylon Andicola, or Carnauba, and that of Myrica Cerifera, or Myrtle Wax.—Mr. P. Guyot communicates the following characters by which the vegetable wax from the two above-named sources may be distinguished:

Carnauba Wax.—This is generally of yellowish-white color, very hard, and of smooth fracture. *Sulphuric acid* poured on the fused wax develops a light-yellow color, and white and brown streaks; after awhile the color passes to dark-brown. By agitation, the whole mass becomes deep red-brown. *Phosphoric acid* bleaches the fused wax slightly. On raising the temperature a whitish emulsion is produced. *Nitric acid* imparts to the wax a golden-yellow color, which gradually turns reddish, intermixed with brown streaks. Hot nitric acid attacks the wax with violence. *Acid nitrate of mercury*, poured over the fused wax, does not color it; after the addition of sulphuric acid, a light-brown color is developed. *Bichromate of potassium* and *sulphuric acid*, when brought in contact with the fused wax in a tube, turn it first brown, then black.

Myrtle Wax.—Sulphuric acid produces immediately upon the fused wax a deep red-brown color, followed by dark-brown and mahogany-brown. The reddish streaks are darker than the color of the liquid. By agitation and cooling, the mass assumes a pale dirty-brown color. *Phosphoric acid* does not alter the wax at its point of fusion, but on raising the temperature, it produces a white emulsion. *Nitric acid* attacks the wax at a temperature of 48° C. (= 118.4° F.), coloring it uniformly golden-yellow, and converting it into a yellowish cream; no streaks are visible in the liquid. *Acid nitrate of mercury*, employed by itself, slightly bleaches the wax; on adding sulphuric acid, a yellowish color is developed, which persists for some time. *Ammonia* has but little effect upon this wax. New Rem., April, 1877, p. 109, from Rép. de Pharm., 1876, 710.

Oleic Acid, New Method of Preparation.—L. Wolff recommends a method which is dependent upon the solubility of oleate of lead in petroleum benzin to the exclusion of associated palmitate or stearate. The starting-point may be oil of sweet almonds, crude oleic acid, or lead plaster, it being necessary to convert the oil or acid into lead plaster if the first two substances are selected. The oleate of lead dissolves readily in the benzin, the solution is decomposed by the addition of dilute hydrochloric acid, and the supernatant solution of oleic acid decanted and evaporated. The process is convenient, economical, and certain. A. J. Ph., Jan. 1877, p. 3.

Ricinoleic Acid, Conversion into Stearic Acid.—A. Claus and Hassenkamp have effected the conversion of ricinoleic into stearic acid. Pure ricinoleic acid is made by fractional precipitation of castor oil soap with chloride of calcium, the first two-sixths being impure, the next three-sixths fractions pure ricinoleate of calcium. The acid had the composition $C_{18}H_{34}O_3$, and yielded with nascent hydrogen iodide (generated by adding phosphorus and iodine in the presence of a little water, and heating in a water-bath) iodostearidenic acid, $C_{18}H_{33}IO_2$. On treating the latter with nascent hydrogen, by boiling with zinc filings and hydrochloric acid, stearic acid, $C_{18}H_{36}O_2$, was obtained, and its identity proven by the form of the crystals, its solubility, fusing-point, elementary composition, and the properties of its ethylic ether. A. J. Ph., April, 1877, p. 172; Ber. Chem. Ges., 1876, 1916.

Hypophosphite of Olein.—Under this name Dr. C. G. Polk pro-

poses a compound which, he claims, is identical in its chemical constituents with the protogen of the brain. By the following method he obtains a preparation in which this compound is represented: Take of olive oil, 24 ounces; lard oil, 6 ounces; Valentine's extract of beef, 2 ounces. Mix, heat, and saturate with phosphorus; then *slowly* introduce dry oxygen until the phosphorus is decomposed. Two ounces of this may be added to fourteen ounces of cod-liver oil, the administration of the two combined being more efficient in the treatment of tubercular consumption than either of them alone. It is necessary that the oxygen shall be introduced with great caution to avoid accident. The author had found that when oxygen is passed into phosphorated oil alone, monobasic hypophosphorous acid simply is formed; but when introducing it in the presence of a nitrogenous element (beef-juice in this instance), the result was almost identical with cerebric or tribasic hypophosphorous acid in its chemical attributes. Drug. Circ., Oct. 1876, p. 170.

Elæomargaric Acid.—M. Cloez gives this name to a solid, fatty acid, fusing at 41° C. (= 105.8° F.), separated from the crystalline salt obtained by saponifying with alcoholic solution of potassa the oil expressed from the seeds of *Elæococca vernicia.* The oil yields about 72 per cent. of its weight of this acid. The acid exists in the oil in combination with glycerin (oxide of glyceryl?), as trielæomargarin, a liquid, neutral, immediate principle, having the curious property of solidifying under the influence of light, without any change in its elementary composition or neutral state. Elæomargaric acid is a superior homologue of sorbic, linoelic and palmitolic acids, its place being between the last and stearolic acid, obtained by the action of potassa on bromated oleic acid. Its composition, when prepared without exposure to air and dried in a current of hydrogen at 110° C. (230° F.), is represented by the formula $C_{17}H_{30}O_2$. It is a non-saturated body, rapidly oxidizable by air at the ordinary temperature. Solution of elæomargaric acid in ether or bisulphide of carbon can be preserved indefinitely in the dark, and sheltered from air. When exposed to the light the acid is modified, but remains dissolved. Upon distilling off the solvent in a current of hydrogen, the residue consists of the modified acid, fusing at 71° C. (= 159.8° F.), mixed with a very small quantity of a liquid, fatty acid, that is produced under other conditions in a state of purity. In an alcoholic solution of elæomargaric acid, saturated in the cold, this transformation takes place very rapidly un-

der the influence of light, the tube eventually becoming filled with magnificent lamellar crystals. To obtain the crystals pure they should be rapidly pressed between several folds of paper and removed from the action of air, traces of alcohol or water being driven off by heating them to 110° C. (= 230° F.) in a current of dry hydrogen. The new acid has been named by the author:

Elæostearic Acid.—It has the same composition as elæomargaric acid, but differs from it in the fusing-point being 23° C. (= 41.4° F.) higher (30° C. = 54° F.?), and in being much less soluble in cold alcohol. It is found in the state of glyceride in oil of elæococca concentrated in the sun or by the action of bisulphide of carbon or sulphuric acid. Upon heating these two solid acids to 175° or 180° C. (= 347° or 356° F.) in sealed tubes containing hydrogen, nitrogen, or carbonic acid gas, they are converted into a liquid modification, apparently without either absorption or separation taking place. Elementary analysis confirmed the fact of the transformation of these two isomerous solid acids into a third liquid acid having the same composition. This has been named by the author

Elæolic acid, and it is the acid referred to as present with the elæostearic acid formed by the exposure of elæomargaric acid to the light. It is also found among the products of saponification of oil of elæococca that has solidified in the sun. These experiments explain, the author considers, the curious properties that have been observed in elæococca oil (see Proceedings, 1876, p. 202). Ph. J. Trans., March 17th, 1877, p. 756.

CARBOHYDRATES.

Collodium Cotton.—W. Godeffroy has determined that collodium cotton, which is rapidly and perfectly soluble, may be obtained by observing the following directions: 35 grams of clean cotton are deprived of fat by heating with a solution of carbonate of sodium, then boiling in water containing a small quantity of caustic potassa, and thoroughly washing with water, finally with distilled water. The cotton is then thoroughly dried, torn up as loosely as possible, and introduced by means of a pestle into a mixture of 700 parts of sulphuric acid and 350 parts of dry nitrate of potassium, having a temperature of 56° C. (= 132.8° F.), in which it is allowed to remain for seven minutes. It is then rapidly transferred to a large vessel containing hot water, and is thoroughly washed in a current

of cold water until it is completely deprived of acid. It is finally washed with distilled water several times, and dried. Longer exposure does not influence the quality of the collodium cotton. Zeitschr. Œst. Ap. Ver., No. 13, 1877, p. 209.

Collodion Cotton.—G. H. Charles Klie has found the following method to insure a uniformly soluble cotton: Mix in a mortar, of the proper size, $7\frac{1}{4}$ ounces of granulated nitrate of potassium and $6\frac{3}{4}$ fluid ounces of sulphuric acid, and immediately steep in it, with the aid of a pestle, 180 grains of cotton, freed from impurities. Let stand twelve to fifteen hours; wash the product thoroughly, first with cold and then in boiling water, and dry by means of a vapor-bath, or, if it is to be used immediately, displace the water by alcohol and express. The acid used in this formula may vary between 1.833 and 1.900, without necessitating a change in the proportion. The author has also determined that a variation of (a lower?—Rep.) temperature does not affect the result unfavorably. In one experiment he had immersed the cotton one hour after the acid mixture had been prepared, during which the temperature had fallen from 122° to 78° F. The product, exposed for the same period above indicated, was perfectly soluble. A. J. Ph., June, 1877, p. 301.

Iodide of Starch.—According to Bellini, iodide of starch possesses the properties of a powerful antidote to many poisonous substances, apparently combining with them, and forming with them insoluble compounds. The author regards it of special importance in cases of poisoning by alkaline sulphides, caustic alkalies, ammonia, and the alkaloids in general. It is neither unpleasant to the taste, nor does it possess any irritant action when administered, and may therefore be given in large doses without hesitation. Its administration as an antidote is to be followed by an emetic. Zeitschr. Œst. Ap. Ver., No. 15, 1877, p. 243.

Sugar, New Reaction.—Viedau observes that when cane-sugar or glucose is added to a mixture of equal volumes of hydrochloric acid and benne oil (ol. sesami), a distinct rose-red color is produced. The reaction takes place in the cold as well as by gentle heating, but at least one milligram of sugar is required for each c.c. of the mixture. Zeitschr. Œst. Ap. Ver., Sept. 10th, 1876, p. 414.

Melon Sugar.—A company has been formed in California with the object of cultivating melons for the purpose of producing sugar from them. There is every prospect of success in this enterprise.

Sugar can be made with far less trouble from the melon than from beet-root; nothing like the same amount of purification is necessary. The cultivation and collection of melons is much easier than that of beet-root, and lastly, the surplus of the melons can be turned to valuable account. The seeds yield an oil admirably adapted to table use, while the final residue makes a nutritious food for cattle. It is probable that beet-root can be grown in a smaller space than can melons to yield an equal proportion of sugar, but there are, doubtless, many parts of the world where this consideration would be overbalanced by the economy in labor and expense of cultivation. New Rem., May, 1877, p. 159.

Glucose, Modification of Böttger's Test.—Prof. Brücke finds that while Böttger's bismuth test for urine has many advantages over Trommer's copper test, it may nevertheless lead, under certain conditions, to false results, since the presence of sulphur (occasionally present in urine) will cause the same reaction as does glucose. Hence he recommends that the liquid (*e. g.*, urine), if it contains a sulphur compound, be first acidulated faintly with hydrochloric acid, then treated with a solution of iodide of bismuth and potassium, which completely removes sulphur, while it does not affect the glucose in the slightest degree. After a few minutes the solution is filtered, and boiled a few minutes with an excess of concentrated solution of caustic potassa; if the solution is now colored gray or black, or such a precipitate is formed, the presence of sugar is proven beyond a doubt. Ph. Centr. H., June 14th, 1877, p. 197.

Glucose, New Reagent.—A. Soldaini recommends solution of carbonate of copper in carbonate of potassium, prepared by dissolving 15 grams of precipitated carbonate of copper in a solution of 416 grams of carbonate of potassium in 1400 c.c. of water. The reagent is reduced by glucose and lactose, but not by saccharose, dextrin, starch paste, tartaric or uric acids, or normal urine. Tannic and formic acids, however, cause a separation of suboxide of copper when heat is applied. Ph. Centr. H., Oct. 19th, 1876, p. 363.

Glucose, Ammonio-cupric Sulphate, a New Reagent.—Fred. B. Power has found that ammonio-sulphate of copper is available as a test for grape-sugar, which, while not as delicate as Trommer's or Fehling's test solutions, may be useful as a corroborative test. If a drop of the ordinary test solution of sulphate of copper (1 to

14) be allowed to fall into a test-tube, a slight excess of ammonia added, and diluted with a small quantity of water, upon adding a few drops of solution of glucose, and heating to the boiling-point, the liquid becomes perfectly decolorized. It was found that the quantity of crystallized glucose necessary to produce this result approximated to $\frac{1}{13}$th grain, which he considers the limit of detection. The decolorized solution, after standing a few hours exposed to air, again assumes its original blue color. Lactose and dextrin produce the same reaction as glucose, but a somewhat more concentrated solution of dextrin is required. Mannit or saccharose are incapable of effecting this change even in highly concentrated solutions. A. J. Ph., Jan. 1877, p. 13.

Glucose, a New Volumetric Method.—Knapp's method for determining glucose is based upon the completeness with which glucose reduces alkaline solutions of cyanide of mercury to metallic mercury; the reaction being made by allowing the glucose solution to flow into the mercurial solution until a drop, placed upon filtering-paper, is no longer browned on holding over it a glass rod moistened with sulphide of ammonium. The method, while reliable, and in certain respects superior to that of Fehling, is somewhat tedious. R. Sachse has overcome this by substituting alkaline iodohydrargyrate of potassium for cyanide of mercury, and protochloride of tin for sulphide of ammonium, as indicated. 18 grams of pure dry iodide of mercury are dissolved in water by the aid of 25 grams of iodide of potassium, 80 grams of caustic potassa (dissolved in water) are added, and the solution brought to the measure of 1000 c.c. 40 c.c. of this solution, corresponding to 0.72 gram of iodide of mercury, are heated to boiling, and the sugar solution is gradually allowed to flow in, at first 5 c.c. at a time, then 1 c.c. at a time, and finally for the third determination, 0.1 c.c. at a time, in the manner in which the titrometric determinations are usually made. The operation is ended when a drop of the solution, added to a drop or two of solution of protochloride of tin, no longer produces a brown precipitate, and thus evidences complete freedom from mercuric salt. 40 c.c. of the reagent correspond to 0.1501 gram of glucose. Ph. Centr. H., Sept. 14th, 1876, p. 324.

Raffinose, a New Sugar-like Substance.—During experiments made to determine the most favorable conditions for separating sugar from molasses, D. Loiseau obtained a new sugar-like substance, which, in a pure condition, forms more or less large crystals. It is nearly insoluble in 90 per cent alcohol at 20° C. (= 68° F.);

water at the same temperature dissolves about one-seventh of its weight, while at 80° C. (= 176° F.) it dissolves raffinose in all proportions. Its rotatory power is much greater than that of (cane?) sugar, being as 159 to 100. Its elementary analysis gave numbers corresponding to the formula $C_6H_7O_7$, and losing 15.1 per cent. of water at 100° C. (= 212° F.); its formula seems to be expressed by $C_{18}H_{16}O_{16}+5H\dot{O}$. Its small crystals are colorless. Ph. Centr. H., Aug. 17th, 1876, p. 284.

Sugar of Milk, Manufacture in Switzerland.—A. Sauter communicates some interesting facts in relation to the manufacture of milk-sugar in Switzerland. The crude sugar, locally called "Schottensand," "Zuckersand," and "Déchet de lait," is produced chiefly in the Alpine districts of the cantons Luzerne, Berne, and Schwyz, considerable quantities being also produced in the Gruyère. It is produced by the simple evaporation of the whey remaining from the preparation of cheese, and is delivered to the refiners, of which there are at the little mountain village of Marbach five or six, in bags containing from one to two cwt. The crude sugar is first washed, and is then dissolved to saturation over the fire in copper kettles, strained into copper-lined tubs or oblong tanks, in which it is allowed to crystallize upon small rods of wood introduced for this purpose. The process of crystallization is ended in from ten to twelve days, after which the sugar is washed, thoroughly dried, and packed in barrels containing from four to five cwt. The whole process, as conducted, is quite primitive; no rational method of clarification is employed, and the product is consequently not as white as it should be. The crude material is only obtainable during summer. From 1800 to 2000 cwt. are annually produced, which appears to be chiefly consumed in Asia and America. Schweitz. Wochenschr. f. Ph., No. 42, 1876, p. 340.

Mannit.—L. Vignon communicates to "Annal. de Chém. et de Phys." the results of a series of comprehensive investigations upon mannit. If mannit is heated for some time with sulphuric acid at 120° C. (= 248° F.), it is, by the abstraction of the elements of water, converted into a substance which the author names "Mannitan."

Mannitan is composed of $C_6H_{12}O_5$ (O = 16). It forms a yellowish-white, somewhat sticky mass, possessing a sugar-like taste, freely soluble in water and alcohol, but not in ether. When exposed to the air for some time, it deliquesces, becomes liquid, and mannit is

regenerated. The same regeneration is effected rapidly when mannitan is heated at 100° C. (= 212° F.) with the hydrate of plumbic or baric oxide. By adding mannitan to a mixture of concentrated sulphuric and fuming nitric acids,

Nitro-mannitan is formed. This is insoluble in water, but soluble in alcohol and in ether. By striking it under the hammer it detonates violently.

Two new bodies,

Mannit-ether and *manniton*, have been obtained by heating mannit with water in sealed tubes. The first named is amorphous and sticky. Manniton is obtainable in well-formed crystals, and is isomeric with mannitan. Arch. Ph., July, 1876, p. 62.

ORGANIC ACIDS.

Formic Acid, Volumetric Determination.—Portes and Ruyssere remark that the quantitative determination of formic acid in acetic acid has a certain importance in solving the problem of the determination of wood spirit in spirit of wine. They pour into a flask containing 5 grams of acetate of sodium 25 c.c. of a solution containing 10 per cent. of the mixture in question, and add 200 c.c. of a solution containing 4.5 per cent. of (corrosive ?—Rep.) sublimate. The mixture is heated from one to one and a half hours in a water-bath until the supernatant liquid has become perfectly limpid. The whole is then made up to the volume of 500 c.c. and filtered. It is then ascertained, by means of a graduated burette, how much of the reduced liquid is required to saturate 1 gram of iodide of potassium. The number found by calculation must be corrected by the addition of one-fourth. Chem. News, July 21st, 1876, p. 32, from Compt. Rend., June 26th, 1876.

Acetic Acid, Presence of Copper.—L. C. Hogan observed, in making a solution of acetate of ammonium, that an oversaturation of alkali produced a slight blue coloration of the solution. Upon examination this proved to be due to the presence of copper, which, quantitatively, proved to amount to 0.397 metallic or 1.584 per cent. acetate. The Pharm., Oct. 1876, p. 291.

Benzoic Acid, Antiseptic Properties and Comparison with Salicylic Acid.—A series of experiments, made by Henry Trimble, upon the comparative antiseptic value of salicylic acid, benzoic acid obtained by sublimation from benzoin, and benzoic acid

"supposed" to be obtained from hippuric acid, lead him to the following conclusions:

1. That benzoic acid, sublimed or artificial, possesses valuable antiseptic properties.

2. It has the power to arrest decomposition.

3. Tannic acid (of buchu ?) does not interfere with its preservative properties.

4. As an antiseptic, it is superior in many if not in all cases to salicylic acid. It also has the advantage of being more readily obtained in a state of purity, of being more soluble, and having a lower commercial value. A. J. Ph., Aug. 1876, p. 347.

Salicylic Acid, a New Source.—Dr. Broughton, of Ootacamund, finds the volatile oil of *Andromeda Leschenaultii*, a plant abounding in inexhaustible quantities in the Neilgherries, a profitable source of salicylic acid. The volatile oil is closely related to oil of wintergreen, and consists almost exclusively of salicylo-methylic ether. By treating the oil with solution of caustic soda, and decomposing the solution of salicylate of sodium by a mineral acid, perfectly pure salicylic acid may be readily obtained at a cost of about four shillings a pound. *Gaultheria punctata*, which is very abundant in Java, yields, according to Dr. De Vrij, 1.5 per cent. of volatile oil, which may also become a source of salicylic acid. Ph. Centralhalle, July 6th, 1876.

Salicylic Acid, Purification.—It is stated that salicylic acid can be obtained colorless and pure by subjecting it to dialysis, and that this is the only method whereby it may be completely purified from associated resinous coloring-matter. Ph. Centr. H., Oct. 5th, 1876, p. 346.

Salicylic Acid, Test of Purity.—Kolbe recommends that 0.5 gram of the acid be dissolved in 10 parts of strong alcohol, and the solution allowed to evaporate spontaneously upon a watchglass. If the acid is pure, the ring of crystals formed around the edge of the glass is composed of handsome efflorescent aggregations, which, when effloresced, are pure white, whilst the ordinary precipitated acid leaves a yellowish or yellow ring under the same circumstances. If the ring is brownish or brown, even when the acid under examination appears white, it is to be rejected as too impure. Ph. Centr. H., Oct. 12th, 1876, p. 355.

Salicylic Acid, Test for Purity.—Hager finds that perfectly pure salicylic acid will dissolve in pure conc. sulphuric acid, forming a

colorless liquid, and proposes this as a test for its purity. A number of samples examined by this method produced more or less colored solutions, varying from yellowish to yellow and brown, and among those some samples which had been found pure by the test proposed by Kolbe. The test is applied by agitating a quantity of the salicylic acid, about the size of a bean, with 5 c.c. of pure conc. sulphuric acid until it is dissolved, and viewing the solution by transmitted light. Ph. Centr. H., Dec. 21st, 1876, p. 434.

Salicylic Acid, Test for the Presence of Carbolic Acid.—Prof. Almén employs for this purpose ammonia and chlorinated soda, which produce, with carbolic acid, a blue color, turning red by acids and blue again on the addition of an alkali. Solutions of phenol, containing one in 5000, produce the color at once; solutions one in 50,000, only after twenty-four hours. Salicylic acid does not give this reaction. It is important that an excess of chlorine be avoided, and that sufficient ammonia be added to impart an alkaline reaction. A. J. Ph., June, 1877, p. 314, from Phar. Zeitung.

Salicylic Acid. Relation to Solvents.—J. C. Thresh has studied the relation of salicylic acid to such salts as borax, phosphate of sodium, citrate of ammonium, and citrate of potassium, all of which have been proposed and used as agents for increasing its solubility in water. He finds that when *borax* and salicylic acid are mixed, the taste at first is simply that of the acid and borax, but in a very short time the pasty mass formed acquires a bitter taste, and after a few hours the taste is intensely bitter. If a little freshly prepared mixture be carefully fused the resulting mass at once becomes exceedingly bitter, and if the proportions employed are one of borax to two of acid, the mass is soluble in about twice its weight of water. A dilute solution of 5 grains each of borax and salicylic acid in one ounce of water is devoid of bitterness, and remains so even after keeping a length of time, but stronger solutions soon become bitter. The author has not yet determined the nature of the reaction by which this bitter product is formed. *Phosphate of sodium* has not a solvent effect equal to borax or citrate of ammonium. One part of salicylic acid requires:

2 parts of phosphate to form a solution with 50 parts of water.
2.25 " " " " 25 "
2.5 " " " " 12.5 "

The first and second solutions are colorless, but the strongest solution has a pink tint, characteristic of salicylic salts. *Citrate of ammonium*, whilst increasing the solubility of salicylic acid in water to a much greater extent than *citrate of sodium*, was found to have no advantage in this respect over *citrate of potassium*, and since the latter is more convenient than the ammonium compound, the author uses it by preference. The table shows the solubility:

Salicylic acid,	1	Citrate potass.,	0.75	Water,	100
"	1	"	1.00	"	50
"	1	"	1.15	"	25
"	1	"	1.25	"	20
"	1	"	1.40	"	12.5
"	1	"	1.50	"	7.5

By the aid of citrate of potassium a concentrated solution may also be obtained containing a little alcohol, the proportion being as follows: 1 dr. salicylic acid, 3½ dr. rectified spirit, 1 dr. citrate of potassium, and 3½ dr. water; this solution mixes with water in all proportions. As a result of his further experiments the author finds that, while some reaction, as yet undetermined, does take place between the salicylic acid and the salts employed as its solvents, yet in whatever state the salicylic acid exists in the above-named solution, it is capable of exhibiting in a high degree all those properties which have conferred upon it much notoriety. Ph. J. Trans., Nov. 25th, 1876, p. 429.

Salicylic Acid, Concentrated Solutions.—C. L. Mitchell recommends the following formula for a concentrated solution of salicylic acid, which may be diluted with glycerin, alcohol, or water to any desired degree: Acid. salicylic. pur., ℥ij; sodii borat., ℥j; glycerin, q. s. Mix the acid and borax with f℥iv glycerin, heat gently until dissolved, then add q. s. glycerin to make the measure f℥j. A. J. Ph., July, 1876, p. 305.

In connection with this, the paper of Charles Becker (Ibid., p. 306) is referred to. This author gives his experience with various solvents, including glycerin and borax, the phosphates of ammonium and of sodium, alcohol, dilute alcohol, ammonia water, ether, olive oil, oil of turpentine, etc. He finds that a solution of 1 part each of salicylic acid and borax, in 5 parts of glycerin and 25 parts of water, is permanent, while if the water is increased to 50 parts the solution will precipitate in twenty-four hours.

Concentrated Solution of Salicylic Acid.—2 drachms of pure salicylic acid and 1 drachm of borax are heated with 4 fluid drachms of glycerin until dissolved, and the solution is then brought to the measure of 1 fluid ounce. The solution contains 25 per cent. of salicylic acid, and may be diluted to any degree required by either glycerin, alcohol, or water. New Rem., Nov. 1876, p. 350.

Salicylic Acid, Dispensing.—In case salicylic acid be prescribed with water in insufficient quantity to yield a permanent solution, James W. White recommends to dispense it suspended by the aid of tragacanth, 20 grains of which will be sufficient for a six-ounce mixture. A good pill mass is obtained by beating salicylic acid with one-tenth its weight of borax and the same quantity of glycerin; 6 grains of the mass represent 5 grains of the acid, and do not form an inconveniently large pill. A. J. Ph., July, 1877, p. 314, from Ph. J. Trans., Dec. 1876.

Salicylic Acid.—Experiments have been made by F. S. Case with a view to testing the preservative properties of salicylic acid on mucilage of gum arabic, the syrups of raspberry, poppy, and lemon, and infusion of digitalis. The author finds that in all instances salicylic acid exercises a decided preservative influence, and that this is increased in proportion to the quantity of acid used. A. J. Ph., Aug. 1876, p. 347.

Cresotinic Acid.—This compound has recently been subjected to physiological experiments by Dr. C. F. Buss, who finds it to equal salicylic acid and quinia in its febrifuge properties. The compound is obtained from phenol or phenylic alcohol, cresol or cresylic alcohol being acted upon by carbonic acid in the presence of sodium. Cresotinic acid crystallizes from hot aqueous solutions in colorless prisms, which are sparingly soluble in cold water, but readily in ether, alcohol, and alkaline solutions. Ferric chloride colors its solutions violet, as does salicylic acid. Ph. Centr. H., Aug. 10th, 1876, p. 273.

Lactic Acid and its Soda Salt, Hypnotic Action.—Experiments made by Jeruselimsky seem to prove lactic acid and lactate of sodium to possess hypnotic properties. The acid was administered in twenty-two cases of insomnia in the course of different diseases, but especially in hysteria, and he found that the effect was complete in most cases; quiet sleep occurring in half to one hour after administration. Given in combination with morphia, a much

smaller quantity of the latter is required. A. J. Ph., April, 1877, p. 189.

Ferric Lactate.—Louis P. Carbonell recommends this compound instead of the ferrous lactate. He obtained it in light-brown transparent scales by following the process for the other scale preparations of iron, taking particular care to fully saturate the acid and to avoid high temperature during the whole operation; otherwise a more or less pasty mass will result and a pulverulent compound obtained. The scaled salt is freely soluble in water and in alcohol. Prof. Maisch draws attention to the statement of Wittstein, that "ferric hydrate, dissolved in warm lactic acid, is gradually reduced to the ferrous state," and that, according to Berzelius, ferric lactate is insoluble in alcohol. See "Gmelin's Chemistry." *Lactate of iron and quinia*, and *lactate of iron and strychnia*, may also be obtained in scales. They are soluble in alcohol and water, and have a bitter taste. A. J. Ph., Nov. 1876, p. 489.

Succinic Acid, Presence in Unripe Grapes.—H. Brunner and R. Brandenburg have determined the presence of succinic acid in unripe grapes. The juice of unripe grapes, gathered in June (near Lausanne), was allowed to flow directly upon chalk, and, when saturated in the cold, the liquid was filtered. It was then boiled and filtered to remove protein bodies and to prevent fermentation, and evaporated; a tough, dark-brown mass remaining. This was extracted with hot water, and by repeated treatment with animal charcoal a colorless liquid was obtained, which yielded white crystalline crusts. These, upon re-solution and evaporation over sulphuric acid, formed handsome needle-shaped crystals, which proved upon ultimate analysis to be succinate of lime. Schweiz. Wochenschr. f. Ph., Aug. 4th, 1876, p. 252.

Citrate of Iron and Quinine.—B. H. Paul has recently examined several commercial samples of citrate of iron and quinine, and found them all to be deficient in the amount of quinine, the highest yielding but 9.3 per cent. of precipitate, of which 6.80 per cent. was quinia. The author takes occasion to remark, upon the test of the Br. Ph., that it is by no means severe, but rather likely to make any sample appear fully as good as it can claim to be. While some of the quinine is lost by remaining in solution, the proportion is very small, and is fully compensated for by the retention of a comparatively large percentage (14 per cent.) of water, when the officinal directions for drying the precipitated quinia are

followed. Regarding the statement, sometimes made, that it is impossible to obtain in the finished product the officinal quantity (16 per cent.) of quinia, when operating by the officinal directions and with the officinal quantities, he is disposed to think that this opinion rests solely upon misconception; any discrepancy between the amount of alkaloid in the finished preparation and the proportion used in making it must be due to some unobserved augmentation in the quantity of the product. Ph. J. Trans., April 14th, 1877, p. 829.

Tartrate of Potassium.—According to A. F. W. Neynaber, this preparation is apt to contain tartrate of lime, introduced by impurity in the cream of tartar from which it is made, and its presence is indicated by the salt failing to form a clear solution with 3 parts of water. He has found that if the salt is dissolved in 10 parts of water, nearly all the tartrate of lime is deposited, whereas a greater or less quantity of water does not so completely remove it, and recommends, therefore, that after the first evaporation of the salt, during its preparation, it be again dissolved in 10 parts of water, allowed to stand several days, and then filtered, and evaporated to crystallization. Drug. Circ., March, 1877, p. 53.

Astringent Matters (Tannic Acid), Estimation by Means of Iodine.—F. Jean has found that solutions of astringent principles, when added to an alkaline carbonate, absorb solution of iodine with an energy comparable to that of arsenite of sodium. Numerous experiments have shown that this absorption takes place exactly in direct proportion to the quantity of astringent matter used, and that one part by weight of dry tannic acid absorbs four parts of iodine, forming a compound that has not yet been studied. Upon this reaction he bases a method of estimating astringent matters.

The solution of iodine used is made by dissolving 4 grams of iodine in iodide of potassium and sufficient water to make 1000 c.c. To standardize the iodine solution 10 c.c. of a solution of tannic acid (0.1 per 100) should be placed in a test-tube; 2 c.c. of a solution containing 25 per cent. of crystallized carbonate of sodium is added; then from a graduated burette the iodine solution is added, drop by drop, until it gives a spot upon starch-paper. With a solution containing 4 grams of iodine per litre, the correction is usually 0.1 c.c. for a volume of 10 to 12 c.c.; but the greater or less purity of the carbonate of sodium may cause this correction to

vary slightly. For 0.01 gram of tannic acid, dissolved in 10 c.c. of water, it is usually necessary to employ 10.5 c.c. of solution of iodine, containing 4 per 1000. Under the influence of iodine the solution of tannic acid, even when very dilute, takes a rather intense orange-red color, so that it is impossible to seize sharply the coloration of the iodide of starch, when starch-paste is added to the tannic acid solution. The author, therefore, uses for the purpose a sheet of filtering-paper, over which a slight layer of starch is dusted. When half a drop of liquor containing free iodine is touched on such a paper it is immediately absorbed, and the characteristic violet color becomes perceptible even when the liquor is strongly colored. When the strength of the iodine solution in relation to a known weight of tannic acid has been established, the test liquor can be employed in the titration of other astringent principles, by taking tannic acid as the type of the active principles of astringent matter, as is done by other authors. Experiments made to test its value in the estimation of barks employed in tanneries have given quite satisfactory results. Special experiments made to ascertain whether the extractive matters accompanying tannic acid, in a decoction of oak bark, had any action on the solution of iodine, showed that it could be safely used for such purpose, and that crystallized gallic acid acted upon the iodine solution exactly in the same proportion as tannic acid. Ph. J. Trans., Aug. 26th, 1876, p. 172; Compt. Rend., lxxxii, p. 982.

ORGANIC BASES.

Alkaloids, Determination by means of Lime and Ether.—A Cazeneuve communicates the following general method for determining the presence of alkaloids in vegetable substances:

The substance is finely powdered, moistened (with water?), mixed with one-half its weight of slaked lime, and divided into two equal parts. One of these parts is allowed to dry in the air, the other on a water-bath, and each is then exhausted with ether.

A portion of each of these ethereal extractions is allowed to evaporate spontaneously, the residue is examined under the microscope, and it is endeavored to dissolve it in acidulated water.

A second portion of each of the extractions is treated with an ethereal solution of oxalic acid; this precipitates many alkaloids as oxalates, which are insoluble in ether. The ether may dissolve lime in combination with resinous acids, but such combinations are distinguished by their insolubility in water.

The author admits that many alkaloids are insoluble in ether, but by the above method they are taken up. Morphia, for instance, in the crystalline condition, is not affected by ether, but if opium is treated as above, considerable quantities of morphia are taken up by the ether.

The method is equally applicable to soluble alkaloids, which remain if their ethereal solutions are evaporated spontaneously.

As the ether also dissolves neutral and other proximate principles, a further examination for these is necessary. Zeitschr. Œst. Ap. Ver., Aug. 1st, 1876, p. 337.

Alkaloids, New Method of Determining the Quality of various Pharmaceutical Preparations containing Alkaloids.—Lapage finds the double salt, iodide of cadmium and potassium, an excellent agent for the determination of the alkaloidal strength of various pharmaceutical preparations, the turbidity produced giving the index to the quality of the preparation. He applies the method to the various preparations of opium, cinchona, ipecacuanha, nux vomica, etc., the following examples illustrating it:

(1.) 1 gram of finely powdered Peruvian bark is macerated, with occasional agitation, for two to three hours, in 10 grams of distilled water containing 0.1 gram of sulphuric acid. 70 grams of distilled water are then added, and the maceration is continued, with occasional agitation, for several hours more, after which the liquid is filtered. Upon the addition of a solution of iodide of cadmium and potassium (2.80 grams CdI and 2.50 grams KI in 50 grams aq. dest.) to a portion of the clear solution, strong turbidity and subsequent voluminous precipitation is produced if the Peruvian bark is of good quality, *i. e.*, contains 30 to 35 grams of alkaloids per kilogram; whilst inferior bark, containing 10 to 12 grams or less, gives but faint turbidity or none at all.

(2.) 20 centigrams of finely powdered opium are macerated for half an hour in 25 grams of distilled water, and the infusion is filtered. Two-thirds of the filtrate is tested with the reagent, with which it should produce an immediate and strong turbidity, and subsequent precipitation, if the opium is of good quality. If but 4 to 5 per cent. of alkaloids are contained in the opium, there is but faint or no turbidity produced. The remaining one-third of filtrate is tested for meconic acid in the usual manner (with solution of ferric chloride). Arch. Ph., Sept. 1876, pp. 271–272, from Rép. de Pharm.

Morphia, Determination in Opium.—E. F. Teschemacher recommends the following method for determining morphia in opium:

1000 grains of opium are macerated from twelve to twenty hours in about 4000 grains of cold distilled water, together with 300 grains of acetate of lead, stirring the mixture from time to time. This separates the meconic acid as meconate of lead, whilst the morphia is dissolved as acetate. After this maceration, the opium may be readily ground in a mortar to a paste, and so much more cold distilled water is added, rinsing the mortar and pestle with successive portions, as to fill a measure of the capacity of 20,250 grains of distilled water. Experience has shown that the space occupied by the insoluble matter measures 200 to 300 grains, so that the limit of possible error by averaging and allowing 250 grains for the insoluble portion amounts to 0.05 per cent. in opium containing 10 per cent. of morphia. The mixture is to be filtered, and 15,000 measured grains, = 750 grains of opium, of the clear solution are to be evaporated to an extract on a water-bath, and this residue to be drenched with 3000 grains of boiling alcohol or methylated spirit, and the whole digested together with frequent stirring for about ten minutes. This separates the gum, etc., of the opium. At this stage of the process, it is well to get rid of the excess of lead salts, and for this end sulphuric acid is preferable to sulphuretted hydrogen. Dilute sulphuric acid, equal to 30 grains of oil of vitriol, is added, which is in slight excess of the required quantity, the excess being in the course of the subsequent treatment converted into sulphate of ammonium. The mixture is allowed to settle in a beaker for twelve hours, is filtered, and the insoluble residue washed with alcohol (methylated spirit). The alcoholic filtrate is then distilled to about 1000 grains, and, while still hot, 440 grains of solution of ammonia, sp. gr. 0.880, is added, stirring rapidly and continuously for at least twenty minutes, whilst the vessel and its contents are cooled as rapidly as possible by plunging into an external vessel filled with cold water. This insures the precipitation of the morphia *in fine powder*, a condition which permits, subsequently, the easy separation of any *narcotia* which may be mixed with the morphia. The precipitate is now immediately transferred to a filter of sufficient capacity to hold the whole, and when the liquid portion has passed through, wash the precipitate with "*morphiated spirit*" (which will be described below) until the mother water is completely removed. To do this effectually requires some little care. Thus the morphia on the filter must be

kept in a spongy condition and never allowed to cohere, which is easily effected by pouring the "morphiated spirit" round the edges of the filter, so as not to disturb the precipitate. The precipitate is now to be washed from off the filter with "*morphiated water*" (also to be presently described), and digested therein for a few minutes, which removes some more coloring-matter, together with any salts soluble in water, but insoluble in alcohol, which may have adhered to the precipitated morphia; then once more collect the precipitate on a filter, washing it with "morphiated spirit;" after this, once with ether, and finally, thrice or more with benzin, which completely frees it from narcotia. The precipitate, which is now pure white morphia, is dried at a low temperature, say 100° F., and weighed. It remains to describe the "morphinated spirit" and "morphinated water."

Morphinated spirit is prepared by mixing 1 part of solution of ammonia, sp. gr. 0.880, with 20 parts of methylated or unmixed alcohol, and digesting in this a large excess of morphia for several days, with frequent agitation, so as to saturate it with morphia. It is then filtered, and contains 0.33 per cent. of morphia.

Morphinated water is prepared by saturating water with morphia, by frequent and long-continued agitation of an excess of morphia with water. It contains 0.04 per cent. of morphia. Ch. News, Feb. 2d, 1877, p. 47.

Hydriodate and Hydrobromate of Morphia.—Pelletier had found that the hydriodate of morphia, when prepared by dissolving morphia in hydriodic acid, formed a white, silky, glistening salt, which was very soluble in water, while Winkler, who had prepared it by double decomposition between iodide of potassium and acetate of morphia, found it to be sparingly soluble in water. The quantities of water of crystallization, as given by these authors, differed likewise, and E. Schmidt has therefore experimented with a view of determining the identity or difference in the compounds as obtained by the two methods, and finds them to be identical in all their characters. As obtained by either of the two methods, hydriodide of morphia crystallizes in long, silky, glistening groups of needles, which have the composition $C_{17}H_{19}NO_3HI+2H_2O$ (O = 16). The two molecules of water are completely dissipated at a temperature of 100° C. (= 212° F.), but on exposure to air are again completely absorbed. The salt is sparingly soluble in cold, but more readily in hot water. The author has also prepared the hydrobro-

mate of morphia; this crystallizes in similar form to the hydriodate, forming similar groups of needles, which also contain two molecules of water of crystallization. These are dissipated, as in the case of the hydriodate, at 100° C. (= 212° F.). Ph. Centr. H., June 7th, 1877, p. 185, from Ber. Chem. Ges.

Acetate of Morphia.—Merck states that while the freshly prepared salt is easily and completely soluble in water, there is a continual slow evolution of acetic acid, causing the salt to become incompletely soluble, and that it is further altered by long keeping, becoming yellow and even brown. The recently prepared salt is soluble in cold strong sulphuric acid without coloration, but at the end of a few weeks it will no longer dissolve without producing faint coloration, although the salt may still be white. No loss of medicinal properties through the decomposition is experienced unless an intense yellow color has been acquired. A. J. Ph., Feb. 1876, p. 71; Ph. J. Trans., Sept. 1876, p. 229.

Apomorphia ($C_{17}H_{17}NO_2$).—The following method of its preparation has been adopted by a commission on "Standard Formulas" by the Pharmaceutic Society of Paris: Introduce 1 part of pure morphia and 20 parts of pure hydrochloric acid into a strong glass tube, closed at one end, and capable of holding at least fifteen times the quantity. Close the open end of the tube by fusion, and insert it into a cast-iron tube closed (at one end) with a screw plug. Place the whole apparatus into an oil-bath, and heat about three hours to between 140° and 150° C. (= 284° to 302° F.). After cooling, the tube may be opened without risk, for there is no pressure of gas inside. The solution is poured out, diluted with water, neutralized with bicarbonate of sodium, and finally an excess of this salt is added, which throws down apomorphia, and any remaining unaltered morphia. The supernatant fluid having been decanted, the precipitate is treated with ether or chloroform until dissolved or exhausted, by which apomorphia alone is taken up. To the ethereal or chloroform solution enough hydrochloric acid is added to neutralize the base, which separates now spontaneously from the solution, and deposits on the walls of the vessel. These crystals are rapidly washed with cold water, and purified by recrystallization from boiling water. The pure alkaloid may be obtained by precipitating the solution of the hydrochlorate with bicarbonate of sodium; a white precipitate is obtained, which rapidly turns green in the air. It must be quickly washed and dried. Its solution soon

turns green and spoils, but sugar or exclusion of air prevent the change. New Rem., April, 1877, p. 125, from Rép. de Pharm., Nos. 2, 3, 1877.

Muriate of Narcëia.—Karl Heintz communicates an interesting and lengthy paper upon the physiological action of muriate of narcëia. As the results of very comprehensive and critical experiments, he arrives at the conclusion that narcëina, administered subcutaneously, is nearly as efficient as morphia in the same doses. It possesses the advantage over morphia that, apart from a slight obstipation, its administration is but rarely followed by the unpleasant after-effects observed after the administration of morphia, and that its action extends over a longer period. The only serious objection is its sparing solubility, which renders it less convenient to use than the readily soluble morphia. Its application in medicine will therefore be in a measure restricted, but the author thinks it will prove invaluable in all such cases where prolonged and deep narcosis is required, or when morphia is not acceptable to the patient. N. Rep. Ph., Nos. 11 and 12, 1876, pp. 669 to 703.

Quinia, Determination in Certain Admixtures.—Alfred Neobard Palmer communicates the results of a series of experiments made with a view to the determination whether the presence of glycerin, sugar, citrate of ammonium, excess of alkali, etc., interferes with the accuracy of the determination of quinia, when this determination is effected by shaking up the fluid with ether or chloroform after the quinia has been precipitated by an alkali. Working under conditions which are stated below, he finds that:

1. Whether the precipitant be ammonia, potash, or soda, whether added in slight or large excess, the quinia can be completely removed from the fluid by either chloroform or ether.

2. The association of sugar or glycerin with quinia in the fluid does not affect the accuracy of the determination by the agency of *chloroform;* with *ether* as the extracting agent the result does not appear to be so accurate in the presence of these substances.

3. In the presence of citrate of ammonium, accurate results can be obtained with chloroform; but when ether is employed, the ether contains only a portion of the quinia present, the remainder being entangled in the aqueous layer. After detailing numerous experiments made with citrate of iron and quinia, with particular reference to the method of the B. Ph. for estimating the quinia in this compound, he concludes that this approximately accurate

method may be profitably replaced by the application of *chloroform*, as given below, which is absolutely trustworthy, reliable, and rapid.

The author uses for his determinations a pear-shaped glass separating vessel of about four ounces capacity, the pear stalk being represented by a short tube provided with a tight-fitting stopper, while at the opposite end of the vessel, representing the top of the pear core, is another stoppered opening. Through this last opening fluids are poured into the vessel; by the tube they are run out of it. The tube cock of the vessel being closed, a measured quantity of the solution to be examined is run in, then the alkali, lastly chloroform, the whole well shaken and set aside for at least two or three hours. The chloroformic solution is then drawn off, through a small filter, into a weighed dish; more chloroform is poured to the aqueous liquor in the vessel, the two are well shaken, again allowed to stand two hours, and drawn off as before through the filter. The chloroform is now evaporated, and the residual quinia dried at a temperature of 270° F. until it no longer loses weight. Allen ("Ph. J. Trans.," June 3d, 1876) had implied that the "ether residue" of quinia is also hydrated to the extent of 4.28 per cent. when evaporated in a water-bath. In this the author does not agree, but maintains that constant results can only be obtained by weighing the residue after drying at 260° to 270° F. Ph. J. Trans., July 29th, 1876, p. 89.

Referring to Mr. Palmer's statement that the quinia cannot be completely removed by ether from solutions containing citrate of ammonium (as in citrate of iron and quinia, B. Ph.), A. J. Cownley finds this to be erroneous. Operating with 1 gram of citrate of iron and quinia dissolved in 30 c.c. of water, adding sufficient ammonia to precipitate all the quinia, and agitating twice successively with 10 c.c. of the solvent for quinia, he obtained on evaporating to dryness, according to Mr. Palmer's directions:

With ether .	12.9 p. c.	Corrected for mixture in citrate of iron and quinia, 8.9 per cent.	14.17 p. c.
With chloroform,	13.35 "		14.66 "

Mr. Palmer has found his results with ether to vary from 6.5 per cent. to one-half of the natural quantity of quinia, a discrepancy which Mr. Cownley attributes to insufficient washing of the aqueous residue with ether. Ibid., Aug. 5th, 1876, p. 109.

Sulphate of Quinia, Loss of Water of Crystallization.—It is

very generally stated that the anhydrous sulphate is only obtained at a temperature exceeding 110° C. (= 230° F.). A. J. Cownley's experiments, however, show that the salt really becomes anhydrous at 100° C. (= 212° F.), and that when freely exposed to the air in this condition it rapidly absorbs water until it has the composition of a sulphate with two molecules of water; but when the access of air is retarded, the water of crystallization is of varying quantity, and bears no constant relation to the salt until two molecules have been absorbed. Also that freshly prepared sulphate of quinia probably does contain, as stated by Jobst and Hesse, 7½ molecules of water, and that the salt in this condition, when freely exposed to the air, rapidly effloresces until it attains the composition of a sulphate with 2 aq. Ph. J. Trans., Sept. 2d, 1876, p. 189.

Hydrobromate of Quinia, Solution for Hypodermic Injection.—William Silver Thompson finds commercial bromide of quinia to be insufficiently soluble for hypodermic use, and, after trying its preparation by double decomposition between sulphate of quinia and bromide of calcium with unsatisfactory results, devised a satisfactory method. This consists in carefully preparing the alkaloid from the sulphate by the well-known method, dissolving the moist magma in solution of hydrobromic acid and evaporating the resulting solution on a water-bath until a transparent mass remains. Any excess of hydrobromic acid is driven off, and the resulting salt may then be dissolved in sufficient water to make a solution of the strength of 12 grains of hydrobromate in a fluid drachm. From 96 grains of sulphate of quinia about a fluid ounce of such a solution is obtained. A. J. Ph., July, 1876, p. 293.

Sulphate Cinchonidia, Presence and Detection in Commercial Sulphate of Quinia.—B. H. Paul finds that by the Br. Ph. test for the purity of sulphate of quinia, which consists in agitating 10 grains of the salt with a little ammonia and a fluid ounce of ether, a relatively large percentage of sulphate of cinchonidia is liable to be overlooked. While the isolated cinchonidia is but sparingly soluble in ether, the case is very different when it is in admixture with sulphate of quinia, in which event, he finds, as much as 10 per cent. may escape detection, even if a much smaller quantity of ether is used than is directed by the Br. Ph. Indeed the quantity of ether required by the Pharmacopœia is largely in excess of the quantity required, and a considerable quantity of cinchonidia passes unnoticed from this cause alone. The plan which this au-

thor has adopted for detecting the presence of cinchonidia is one of fractional crystallization, and gives very speedy indication of its presence. About 30 grains of the sulphate to be treated are boiled with one and a half ounce of water until the salt is nearly dissolved. Upon cooling, most of the quinia is deposited, and the more soluble sulphate of cinchonidia remains in solution, and by being now tested will give indication of its presence. He has examined a number of commercial samples of quinia, and found that all of them contained sulphate of cinchonidia, and with one exception, in considerable proportions. For the details of the author's method and results, the reader is referred to the original papers in Ph. J. Trans., February 10th and 17th, 1877, pp. 653 and 672.

Aricina, Identity with Cinchonidia.—Pelletier and Cariol had obtained from a cinchona bark, from the port of Arica, an alkaloid which they called *aricina;* the same alkaloid was obtained by Bœrkœhn from a bark exported from Cusco, and was named by him *cusconia;* while Manzini isolated afterwards from the pale penquina bark (Cinch. ovata) an alkaloid, *cinchovatina*, which Bouchardat and Winkler proved to be identical with aricina. O. Hesse has now re-examined these barks, and arrived at the conclusion that the aricina and cinchovatina, when perfectly pure, are identical with *cinchonidia.* The new alkaloid recently obtained by De Vrij from cinchona bark from Jamaica is also cinchonidia. A. J. Ph., April, 1877, p. 172; Zeitschr. Œst. Apoth. Ver., 1876, No. 34; Ann. Chem., 1876.

Indian Quinine (Mixed Cinchona Alkaloids).—The "Ph. J. Trans." (Dec. 16th, 1876, p. 499) reports the results of some physiological experiments made with the mixed alkaloids of cultivated cinchona bark in various Indian hospitals. These results, which were reported Nov. 7th, 1876, show, that while the preparation will readily effect cures, in quantities varying from 30 to 120 grains, it produces so much gastric disturbance that its use will not likely become general as long as quinine and other febrifuge preparations of bark can be obtained.

Cinchona Febrifuge.—G. King, in his report on the cinchona plantation in British Sikkim for 1875–76, says that the "cinchona febrifuge" issued by the quinologist (Mr. Wood) appears to be an efficient remedy in most ordinary cases of malarious fever. It is probable that for severe and critical cases of malarious fever, especially amongst Europeans, sulphate of quinine will long remain in

the estimation of the medical profession the best remedy; but every one who has much experience of India knows that bad cases of fever are more the exception than the rule, and that there is a simply incalculable amount of fever prevalent amongst the natives of the country which rarely takes the form of a violent or fatal attack, but which expends itself in a succession of attacks, each sufficient to incapacitate the sufferer from work for a time, and a repetition of which too often ultimately induces malarious cachexia and diseases of the spleen. There appears to be ample medical evidence for believing that, for malarious fever of this ordinary type, the "cinchona febrifuge" is a most efficient remedy. Ph. J. Trans., Dec. 30th, 1876, p. 537.

Cinchona Febrifuge.—The cinchona plantation on the Neilgherries yields practically two barks, red bark and crown. Red bark is rich in total alkaloids, but not very rich in quinia, and the latter is difficult of separation; hence this bark is of little value to the quinine-maker, although of great value to the Indian government as a source of supply for a cheap febrifuge, which is now issued as the result of a systematic set of experiments, made by Mr. J. Broughton, government quinologist at the Neilgherry plantations. The method at present in operation in the factory in Sikkim is simple in the extreme, and is as follows:

The dry bark is crushed into small pieces (but not powdered), and is put into wooden casks, where it is macerated in the cold with dilute hydrochloric acid. The liquor is then run off into wooden vessels, and mixed with an excess of a strong solution of caustic soda. A precipitate forms, which is collected on calico filters and well washed with water. The precipitate is then dried at a gentle heat, and, when powdered, constitutes the *crude* febrifuge. This is next submitted to a process of purification. A certain weight of the crude product is dissolved in dilute sulphuric acid, and a small quantity of a solution of sulphur in caustic soda is added to the liquor. After the lapse of twenty-four hours, the liquor is carefully filtered, the filtrate is mixed with caustic soda, the resulting precipitate collected on calico, washed with a small quantity of water, dried, and powdered; it is then ready for issue, and is sent out under the name of "*Cinchona febrifuge.*" New Rem., Dec. 1876, p. 356.

Quinium.—J. Brœker draws attention to this product, obtained from Java barks of inferior appearance, the bark of dead cinchona

trees, branches, etc., and considers it to have a good future as a substitute for quinia. Moens has analyzed the preparation made by his method, and finds it to contain in 100 p., 17.20 quinia, 4.53 quinidia, 7.90 cinchonia, 1.10 cinchonidia, 20.45 amorphous cinchona bases, 4.60 chinovin, 1.05 inorganic substances, and 15.83 water. Its therapeutic value, according to Dr. Luchtman's experiments, appears to be equal to quinia in quotidian and tertiary cases; but in quaternary cases it appears to be inferior. Arch. Ph., May, 1877, p. 407.

Brucia.—W. A. Shenstone, operating with commercial brucia by the method by which Sonnenschein had obtained strychnia from brucia (*i. e.*, warming with dilute nitric acid, etc., see Proceedings, 1875, p. 419), also obtained indications of strychnia, but this was subsequently determined to have been present in the brucia as impurity. When operating in the same manner with brucia which had been previously completely purified, he obtained, in one case, a most doubtful indication of strychnia, and in three others none at all. His results therefore confirm those of Cownley (see Proceedings, 1876, p. 353). The impure brucia was determined to contain about 1 per cent of strychnia. He recommends a method for the removal of the strychnia from brucia, which depends upon the fact that strychnia precipitates brucia from its salts, and consists in partially precipitating the brucia from one of its salts with an alkali, standing aside for a few hours, collecting, washing, and redissolving the precipitate; by repeating this partial precipitation, etc., four times, the strychnia was found to be completely removed. The removal of strychnia from the brucia is important, since Andral estimates the activity of brucia as only one-twenty-fourth that of strychnia. Ph. J. Trans., Feb. 10th, 1877, p. 652.

Salicylate of Atropia.—Experiments made by C. R. C. Tichborne have determined that a definite and staple compound of salicylic acid and atropia may be obtained. The author, however, failed to obtain it in a crystalline condition. The proportions for its preparation are 289 grains atropia and 138 grains salicylic acid. If the two are mixed in this proportion, and water added, a solution is shortly effected, which with care will yield salicylate of atropia, resembling the sulphate in appearance; on evaporating the solution, however, it has a tendency to form an amorphous mass which is difficult to powder. One part of the salt requires about 20 parts of water for solution at 15° C. (= 59° F.). A *solution of salicylate*

of atropia, corresponding to the solution of atropia of the B. Ph., may be at once obtained by mixing 2.7 grains of atropia and 1.3 grains of crystallized salicylic acid with 1 ounce of water, and allowing the mixture to stand until it is dissolved. The solution of salicylate of atropia, so prepared, has been tried by a number of prominent physicians, who find it not only to answer all the purposes of the officinal solution, but to possess advantages medicinally as well, as in that it may, apparently, be kept for an unlimited time without undergoing change. Solutions of

Benzoate and *borate of atropia* proved a failure, undergoing change after one or two months. A. J. Ph., April, 1877, p. 152.

Belladonnia and Tropia.—It is on record that along with atropia a second alkaloid is obtained from belladonna. This base was first noticed by Hübschmann in 1858, and by him named belladonnia. Kraut has also occasionally found a second alkaloid associated with commercial atropia, which was separated by him in the form of a resinous mass. Prof. R. Buchheim has recently had opportunity to prepare a large quantity of pure belladonnia (600 grams) from a quantity of "crude belladonnin," which had accumulated in the laboratory of E. Merk. When purified by suitable means the pure belladonnia formed a yellowish-brown mass, which may be triturated to a yellowish powder, but very readily cakes together. It was found to be nearly insoluble in water, readily in alcohol and chloroform, and somewhat less readily in ether. It is readily dissolved by acids, with which it forms neutral salts. Its sulphate is not crystallizable, forming a resinous mass which is quite hygroscopic. He furthermore found that by mixture with caustic potassa in alcohol for twenty-four hours, belladonnia is split into *tropia*—which had hitherto been obtained by a similar process from atropia—and an acid, which is distinct from tropic acid of atropia, and which he has therefore named *belladonnic acid.*

Pure tropia, as obtained by the author, forms a nearly colorless, crystalline mass; when recently distilled, it is a thick liquid of the consistence of castor oil, but soon congeals at ordinary temperature. It is readily soluble in water and in alcohol, has a peculiar tobacco-like odor, and a strong alkaline reaction. When neutralized with sulphuric acid and carefully evaporated, tabular crystals of sulphate of tropia are formed, which are readily soluble in water. By the action of chlorbenzoyl on tropia, it is converted into *benzoyltropia*, a compound which bears great re-

semblance to atropia. This compound may be obtained in crystals by the slow evaporation of its alcoholic solution. *Tropia* does not possess the power to dilate the pupil of the eye, and its action upon the heart is quite feeble. Both *belladonnia* and *benzoyltropia* approach in their action upon the eye and heart to that exercised by atropia, but both are less energetic, benzoyltropia being the weakest. N. Rep. Pharm., No. 6, 1876, pp. 344 to 358.

Crystallized Hyoscyamia.—W. Martindale has examined the crystallized hyoscyamia now found in commerce (Merk's), and finds it to agree with the description given by Thibaut, who first prepared it (see Proceedings, 1876, p. 354). Mr. Martindale finds that it is inferior to atropia in its basic power, four grains requiring only two drops of dilute sulphuric acid for neutralization, while the same quantity of atropia requires five drops. When heated carefully in a porcelain capsule, it first liquefies and then sublimes, producing a white vapor having a peculiar odor, and leaving scarcely a trace of residue. Whilst noticing its peculiar odor, one of the author's eyes was partially blinded for twelve hours through getting some of the vapor into it. In its action upon the eyes it seems, according to J. Tweedy, to be about the same as atropia. Unlike the latter, however, it appears to deteriorate by being kept in a badly stoppered bottle. Ph. J. Trans., Dec. 9th, 1876, p. 471.

Hyoscyamia.—Preliminary experiments made by Prof. Buchheim seem to indicate the existence of two alkaloids in hyoscyamus leaves, the one represented by crystallized hyoscyamia, the other by an amorphous alkaloid contained in the mother liquor from which the hyoscyamia has crystallized. Physiological experiments prove that the action of crystallized hyoscyamia is distinct from that of the mother liquor, and the author's opinion is based on this circumstance. N. Rep. Ph., No. 6, 1876, p. 355.

Crystallized Aconitia ($C_{27}H_4NO_{10}$).—The following formula for its preparation has been adopted by a commission on "Standard Formulas" of the Société de Pharmacie of Paris: Exhaust the powdered root of *Aconitum ferox* with concentrated alcohol to which $\frac{1}{100}$th part of tartaric acid has been added. The solution is distilled at a moderate heat, out of contact with air, to recover the alcohol. The residue is taken up by water, which leaves fatty and resinous substances behind. The watery solution of impure tartrate of aconitia is shaken with ether to remove coloring-matters, and then decomposed with alkaline bicarbonate until effervescence ceases, thereby

liberating the alkaloid. Upon now shaking the solution with ether, the latter dissolves the alkaloid, and leaves it upon evaporation. To obtain the aconitia in crystals, some petroleum-ether should be added to the ethereal solution. It forms colorless, hexagonal rhombic tables, which are soluble in alcohol, benzole, and chloroform; insoluble in petroleum oils and glycerin. New Rem., April, 1877, p. 125, from Rép. de Pharm., Nos. 2 and 3, 1877.

Veratria.—Ernst Schmidt and R. Köppen have again examined veratria as prepared by themselves from sabadilla and from commercial alkaloid, and obtained results which in the main agree with those originally obtained by Merck (1856), except that they find its formula to be $C_{32}H_{50}NO_9$ (O = 16). They also found Weiglin's observation (1871) correct regarding the existence of a veratria, which is soluble in water, and may be obtained by precipitating a veratria salt by ammonia in the cold, and washing it with cold water, in which it gradually dissolves, but is reprecipitated by heat. On evaporating the solution in vacuo, a yellowish amorphous mass is obtained, which is again readily soluble in water, and has the composition of the crystalline modification. The resinous mass, which is dissolved from crude veratria by cold dilute alcohol, is another modification of the same alkaloid, differing from the first by not being crystalline, and from the second by the sparing solubility in water; the first and the last are gradually converted into the second modification by precipitating them in the cold and prolonged washing with cold water. The authors have also examined samples of commercial veratria from six manufacturers, and found them pure and free from *sabadillia* and *sabatrinia*, which are rather freely soluble in water; they dissolved freely in ether, in which sabadillia is insoluble. A. J. Ph., Dec. 1876, p. 539, from Ber. Chem. Ges., 1876, pp. 1115–1221.

Caffeia, Compounds with Organic Acid.—Hager draws attention to the controversy that has from time to time engaged attention regarding the possibility of the formation of salts of caffeia with organic acids, and regards it as proven that organic acids do not form salts with that alkaloid. For this reason the later works on Pharmacology do not mention *citrate of caffeia*, which it is now believed cannot exist. Recently *valerianate of caffeia* has been recommended and prescribed in Holland, according to Haaxmann, who endeavored to prepare, but failed to obtain it after numerous experiments. Valerianate of caffeia also, therefore, appears not to exist. Ph. Centr. H., Dec. 7th, 1876, p. 418.

Thëia, or Caffëia ($C_8H_{10}N_4O_2H_2O$ (O = 16).—The following formula for its preparation has been reported to the Pharm. Society of Paris by a commission on "Standard Formulas:" Exhaust good green or black tea with boiling water to obtain a concentrated solution, which precipitate by a slight excess of basic acetate of lead. Add to the magma a small quantity of ammonia, filter, and separate the excess of lead in the liquid by a current of sulphhydric acid gas. Filter again, and evaporate slowly. On cooling, an abundant crop of nearly pure crystals of caffëia is deposited. The mother liquor yields more crystals on further evaporation. New Rem., April, 1877, p. 126, from Rép. de Pharm., Nos. 2, 3, 1877.

Colchicia, Forensic Determination.—E. Dannenberg has made a comprehensive series of experiments with a view to determine the most suitable solvent in forensic examinations. He has found that ether, which is the solvent recommended in older works ("Otto's Ausmittlung der Gifte"), dissolves colchicia from its acid aqueous solutions much less completely than does chloroform or amylic alcohol. The last named may, perhaps, be regarded to be the strongest solvent in this connection; but chloroform is so nearly equal to it, and its application is so much more pleasant and easy, that the author gives preference to it. If an ethereal solution from an aqueous solution give evidence of the presence of alkaloid without the special reaction of colchicia with nitric acid, the author recommends that the suspected substance be repeatedly extracted with ether; the united ethereal solutions are then evaporated, the residue is dissolved in water, to which a little ammonia has been added, and is then shaken with chloroform, when, if colchicia is present, its characteristic reaction with nitric acid is readily obtained. In the presence of much extractive matter, the author recommends that the ethereal or chloroformic extraction be evaporated, the residue dissolved in water, the solution filtered through a very small filter, the filtrate precipitated with tannic acid, the precipitate washed, treated with oxide of lead, extracted with a little alcohol, and the alcoholic solution evaporated. The colchicia reactions are then obtained very distinct. The author cites as example, that 0.1 gram of colchicia had been dissolved in 1 litre of beer (1-50,000), and that he obtained no reaction either in the ethereal or chloroformic extraction; but after purification by the aid of tannic acid and oxide of lead, as above, the reaction became very distinct, and with the quantities operated on might have been made twenty times. The author has also determined that colchicia

is not readily decomposed, either by contact with decomposing animal matter, or during acid fermentation, during a period of at least three months. Arch. Ph., Feb. 1877, pp. 97–116.

Gelsemia, Preparation and Toxic Effects.—Dr. T. G. Wormley states that by his former process, communicated in 1870 ("A. J. Ph.," Jan.), a large proportion both of the alkaloid gelsemia and of gelseminic acid escape isolation, being lost by the removal of the resinous matter. After trying various methods for the complete recovery of these principles *from the fluid extract*, he recommends the following: A given volume of the fluid extract, acidulated with acetic acid, is slowly added, with constant stirring, to about eight volumes of water; after the separated resinous matter has completely deposited, the liquid is filtered, concentrated to something less than the volume of fluid extract originally employed, and is shaken with ether to remove *gelseminic acid.* After the complete removal of this, a slight excess of carbonate of sodium is added, and the *gelsemia* extracted by ether or chloroform. A series of examinations of commercial fluid extracts, prepared by reputable houses, seems to prove great uniformity in the strength of these preparations, about 0.2 per cent. of gelsemia and 0.4 per cent. of the non-nitrogenized principle having been obtained in each case. The author states that within the last several years quite a number of cases of poisoning by the preparations of gelsemium have been reported. Of thirteen cases reported, nine proved fatal. The fatal dose of the fluid extract varied, in the case of adults, from about one fluid drachm to one tablespoonful; and the time of death from two and a half to seven and a half hours. A. J. Ph., April, 1877, p. 150.

Berberina, Volumetric and Gravimetric Method of Determination.—L. F. Beach has found that Mayer's solution of iodohydrargyrate of potassium will afford with berberina solutions precipitates, which weigh exactly twice as much as the pure berberina which enters into the precipitate. On this fact he bases a volumetric and gravimetric method for the determination of the alkaloid. He finds that 1 c.c. of Mayer's solution precipitates 0.0425 gram of berberina. The volumetric determination is slow, owing to the length of time required for the precipitate to settle after each addition of reagents. Traces of precipitate are observed by placing a drop on a blue or black glass slide. A. J. Ph., Sept. 1876, p. 386.

Eseria (*Physostigmia*), *Preparation.*—The following method of

the preparation of the alkaloid of the Calabar bean has been adopted by a commission on "Standard Formulas," appointed by the Pharm. Society of Paris: Exhaust powdered Calabar beans mixed with 1 per cent. of tartaric acid, by means of repeated digestion and percolation with hot alcohol (about three times the weight of the powder for each digestion). Distil most of the alcohol off, filter the remainder, and heat on a water-bath until all the alcohol has been dissipated. When cold, add a small quantity of distilled water, and filter to separate resinous matter. Shake the filtered liquid with several portions of washed ether, until the latter ceases to become colored. Now add to the aqueous liquid remaining a slight excess of bicarbonate of potassium, again shake several times with ether, unite the ethereal solutions, and allow to evaporate spontaneously, when the eseria will be left behind in crystals, which are rendered pure by a second crystallization.

Bromhydrate of eseria is prepared by dissolving the foregoing alkaloid in colorless bromhydric acid, and evaporating to a syrupy consistence. In a few days fibrous, slightly colored, but not deliquescent crystals make their appearance. New Rem., May, 1877, p. 156.

Neutral Sulphate of Eseria.—A given quantity of eseria is directly and *exactly* saturated with sulphuric acid diluted with nine parts of water. Or an ethereal solution of eseria is shaken with a measured quantity of dilute sulphuric acid of known strength, sufficient for *exact* neutralization. Either solution is immediately evaporated to dryness at a gentle heat. It is usually obtained amorphous, although it may, with great difficulty, be obtained crystalline. It is very deliquescent and must be preserved in a well-closed vial. The dose of the salt is 0.001 gram (about $\frac{1}{64}$th grain) internally. For producing contraction of the pupil, 0.02–0.05 gram ($\frac{1}{3}$–$\frac{3}{4}$ grain) is dissolved in 10 grams (162 ♏) of water. Ibid., June, 1877, p. 188.

Hydrobromate of Conia, Preparation of the Crystallized Salt.—Mourat has recently made experiments with a view of obtaining crystallized salts of conia. After trying various acids he finds that the hydrobromate is the salt most easily obtained in crystals. The ordinary brown conia may be used for this purpose, but its use is attended with much waste; he therefore prefers the German conia, which is nearly white. The conia is placed in a crystallizing vessel with a fragment of blue litmus-paper, and dilute hydrobromic

acid is added drop by drop, until the litmus-paper commences to turn red; the liquid, which is at first yellow, then has a rose tint. The crystallization quickly commences, and the evaporation may be expedited by a gentle heat. Hydrobromate of conia crystallizes in colorless prismatic needles that are very soluble in water and in alcohol, but less so in ether and chloroform. The crystals are not deliquescent, are odorless, and have only a slight taste; but when crushed between the fingers they give off a strong odor of conia. When exposed to the air the salt becomes red, like many other hydrobromates, but in the dark it remains white. It supports a tolerably high temperature, melts at about 100° C. (= 212° F.), and above that point volatilizes, giving off the odor of conia. An exact analysis has not been made, but it contains about one-third of its weight of bromine. It is reported to have been administered in hourly doses of 2 milligrams to infants one year old, suffering from hooping-cough, with good results, and in 5 milligram doses to a child three years old. Ph. J. Trans., July 8th, 1876, p. 23; Rép. de Pharm., 1876, p. 369.

Nicotina, Simplified Method of Preparation.—W. Kirchmann has prepared pure nicotina, and readily secured a large yield, by the following method: A tinned iron vessel, provided with two glass tubes, is filled with tobacco which has previously been moistened with solution of carbonate of sodium; one of these tubes reaches to near the bottom of the vessel and serves the purpose of admitting carbonic acid; the other simply passes through the cork of the tubulure, and gives exit to the carbonic acid and the vaporized products of the distillation, ending in a vessel containing a mixture of alcohol and sulphuric acid. The connection being air-tight, the heat of a steam-bath is applied and a rapid current of carbonic acid passed through the vessel until the distillation is ended. The colorless solution of sulphate of nicotina is treated with caustic baryta, evaporated to dryness, the nicotina extracted by ether, and the solution evaporated, the product being pure nicotina.

Nicotina Alum.—The author obtained handsome crystals of a compound which he considers to be nicotina alum, by treating a concentrated solution of acid sulphate of nicotina with hydrate of alumina as long as it dissolved. The crystals are in the form of handsome octahedrons, and seem calculated to form a convenient means of exhibiting pure nicotina.

The above-mentioned method is equally applicable to the production of conia and sparteina. Arch. Ph., Sept. 1876, p. 209.

Trimethylamina.—C. Vincent finds that ordinary beet-root molasses will yield an abundance of trimethylamina when it is heated to calcination; the ammonia formed at the same time is very readily separated from it. The aqueous solution of trimethylamina is found by him to furnish an excellent reagent. Its relation to solutions of metals is quite distinct from that of ammonia, as will be seen in the following:

Magnesium Salts.—In neutral solutions a permanent white precipitate is produced; in acid solutions no turbidity occurs, but when phosphate of sodium is added a white amorphous precipitate forms, which gradually becomes crystalline.

Beryllium Salts.—A permanent white precipitate.

Aluminium Salts.—A gelatinous precipitate, soluble in excess of the reagent.

Zirconium Salts.—A permanent white precipitate.

Cerium Salts.—Of the protoxide, a permanent white precipitate; of the sesquioxide, a reddish-white precipitate.

Chromium Salts.—Green modification, a permanent gray precipitate; violet modification, a permanent bluish-green precipitate.

Manganese Salts.—A white precipitate, becoming colored when exposed to air. In acid solutions a precipitate forms after a time.

Cobalt Salts.—A permanent blue-gray precipitate.

Nickel Salts.—A permanent apple-green precipitate.

Uranium Salts.—A permanent yellow precipitate.

Zinc Salts.—A permanent white precipitate.

Tin Salts.—Of the protoxide, a permanent white precipitate; of the sesquioxide, a white precipitate, soluble in excess of the reagent.

Antimony Salts.—A permanent white precipitate; antimoniates, a white precipitate, soluble in a large excess of the reagent.

Bismuth Salts.—A permanent white precipitate.

Lead Salts.—With the acetate no precipitate; with the other soluble lead salts, a white precipitate, soluble in excess of precipitant.

Copper Salts.—A permanent yellowish-blue precipitate.

Mercury Salts.—Of the protoxide, a black permanent precipitate; of the binoxide, a yellow precipitate, permanent, and gradually becoming lighter.

Silver Salts.—A dark-gray precipitate, soluble in great excess of precipitant; the chloride is perfectly insoluble in the reagent.

Palladium Salts.—A brown precipitate, soluble in excess.

Gold Salts.—A light-yellow precipitate, soluble in excess.

Platinum Salts.—A yellow precipitate, soluble in a large quantity of water, readily dissolved by hot water, and crystallizing on cooling. Zeitschr. Œst. Ap. Ver., No. 15, 1877, p. 241.

GLUCOSIDES, ETC.

Glycyrrhizin, Action of Fusing Potassa on Glycyrrhetin.—Gorup-Besanez (1861) found that glycyrrhizin is, by the action of boiling water, split into sugar and into *glycyrrhetin*, and that it is consequently a glucoside. P. Weselsky and R. Benedikt have now treated glycyrrhetin with fusing potassium hydrate and obtained from the fused mass paraoxybenzoic acid as the principal product of decomposition. A. J. Ph., Dec. 1876, p. 540; Ber. Chem. Ges., 1876, p. 1158.

Cyclamin (*Arthanatin*).—Prof. De Luca has found that this substance—the active principle of *Cyclamen Europæum*, L.—may be used as a substitute for curare in the treatment of tetanus, and highly recommends it for this purpose. The principle has been obtained and described by Saladin, Buchner, and Herberger, and latterly, also, by De Luca and Martius. According to De Luca it forms a white amorphous mass, which is odorless, but has an extremely acrid taste. It is readily soluble in water and in alcohol, but insoluble in ether, chloroform, and bisulphide of carbon. Its aqueous solution froths like soapsuds, and when heated to 60° to 70° C. (= 140° to 158° F.), deposits the principle in the form of a coagulum. It is a glucoside, of composition $C_{20}H_{34}O_{10}$, being by boiling with dilute mineral acids split into glucose and *cyclamiretin*, a resinous substance soluble in alcohol, but not in water or ether. Emulsin also has the power to split cyclamin into these bodies. Its physiological action is, according to Pelikan, that of an irritant poison. Ch. Centr. H., No. 3, 1877, p. 17.

Sicopirinum.—Under this name Dr. Th. Peckolt describes a new crystalline glucoside which he obtained from the root-bark of the

Brazilian tree *Bowditchia major*, Mart. (which see, under Materia Medica, in this report). The powdered root-bark is exhausted with absolute ether, the ether is distilled off, and the resin-like red-brown residue is exhausted with cold alcohol of 32°. A crystalline residue remains, which is purified by several recrystallizations from absolute alcohol. So obtained, it forms conglomerations of fine, needle-shaped crystals, resembling poppy-seeds, which possess a bitter, faintly acrid taste, and faint alkaline (?) reaction. It is soluble in ether and in boiling alcohol. Water dissolves mere traces. By the action of dilute sulphuric acid glucose is formed as a product. An ultimate analysis, made by Dr. Geuther, of Jena, gave numbers which correspond to the formula $C_{16}H_{12}O_5$ (O = 16). Zeitschr. Œst. Ap. Ver., July 1st, 1876, p. 289.

Capsaicin.—J. C. Thresh had in a previous paper (see Proceedings, 1876, p. 133) obtained a small quantity of substance which was not an alkaloid, and which was the unmixed active constituent. He has since operated with larger quantities and has obtained the active principle in a pure and crystalline condition from capsicum fruit, and named it *capsaicin*. It exists in the *capsicol* of Buchheim (see Proceedings, 1874, p. 106), from which it is very difficult to remove, and has hence escaped isolation. The author finally succeeded in isolating it by mixing the red oil (capsicol) with twice its volume of almond oil, and then shaking the mixture repeatedly with proof spirit. The almond oil appears to hold on to the fatty principle of the capsicum, whilst at the same time it loosens the affinity of the latter for the active principle, which is completely removed by the proof spirit, the residual oily mixture being devoid of acridity. The alcoholic solution, when evaporated, left a red-brown fatty residue of the consistence of resin ointment, and, of course, of intensely pungent taste. This substance dissolved in dilute solution of potash, forming a clear solution; but when treated with dilute ammonia, a very imperfect soapy solution resulted. This was put aside for some time, and upon again examining it, was found full of well-defined, pearly-white crystals (Fig. 46), which, when washed and dried, proved to be most powerfully pungent, a most minute portion volatilized causing fits of coughing. The substance was, nevertheless, not entirely pure, being—perhaps owing to the presence of a little alkali—slightly soluble in cold water, which the pure substance is not. To obtain it pure, the crystals are dissolved in solution of potassa, and solution of chloride of ammonium is added in excess; the milky fluid

formed deposits of crystals of the pure principle in a few hours. These (Fig. 47), when thoroughly well washed, do not give the slightest trace of ammonia, are insoluble in water, soluble in dilute and strong alcohol. Its solution in proof spirit, when not too dilute,

Fig. 46.

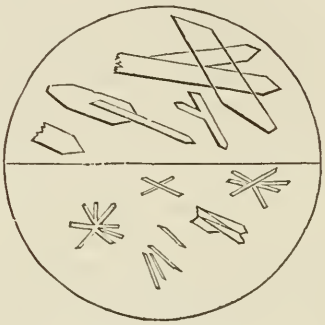


Fig. 47.

gives white precipitates with barium and calcium chlorides, both soluble in ether. Nitrate of silver produces a precipitate which dissolves in dilute ammonia, and the solution, when boiled, deposits a curdy, brown-black precipitate. Neutral ferric chloride does not affect it in the cold, but when the solution is boiled a reddish precipitate falls. Oxidizing agents destroy the pungent taste of the solution. With care, capsaicin can be volatilized without decomposition. It volatilizes slowly at 212° F., and if mixed with water and distilled, the distillate has a distinct pungent taste.

Capsaicin may be obtained direct from the capsicum oil by dissolving it in dilute potash, adding chloride of ammonium, redissolving the colored precipitate in potash solution, and, at a temperature of 120° F., adding chloride of ammonium in slight excess. The crystals formed in a few days may be further purified, if necessary, by a repetition of this process. The author has also obtained the crystalline principle from strong tincture by dialysis. The dialized solution had a distinct acid reaction. Ph. J. Trans., July 8th, 1876, p. 21.

The author has since obtained capsaicin in a pure condition as follows: The crude capsaicin is dissolved in solution of potassa (B. Ph.) and precipitated by carbonic acid ; the precipitate is collected, washed, dried, and dissolved in hot petroleum, out of which solution it crystallized after several days. It was now washed, dis-

solved in alcohol, the solution diluted with water, and exposed to the air but excluded from dust, until most of the alcohol had disappeared and the capsaicin had crystallized. This was collected, washed, and placed on a water-bath until the weight was constant. A portion of the capsaicin, thus purified, was subjected to ultimate analysis in the laboratory of Prof. Flückiger, by Dr. Buri, who obtained figures which correspond to the empirical formula $C_9H_4O_2$. The author has received a large supply of alcoholic extract of cayenne pepper, with which he continues his experiments, and hopes soon to obtain a sufficient quantity of the pure principle to attempt the determination of its relationship to other principles. Ph. J. Trans., Dec. 9th, 1876, p. 473.

Apiol.—During the preparation of oil of parsley by distillation of the seed with water, the so-called camphor of parsley or apiol separates gradually in fine needles. Homolle gave the same name to a mixture of different bodies obtained as green-brown oil, by extraction of the parsley seed with alcohol and ether, and the use of litharge; this is the "apiol" that has been recommended as a substitute for quinia in therapeutics. E. V. Gerichten prefers that the name "apiol" should be confined to the crystallized volatile oil, which can also be obtained direct from the seed by extraction with alcohol, distillation, and digestion of the residue with ether, the apiol passing into solution, whilst apiin remains undissolved. The author's experiments were made with apiol prepared by the latter method.

Apiol forms very long, white, efflorescent needles, having a faint smell of parsley. It melts at 30° C. (= 86° F.), boils at about 300° C. (= 572° F.), and has a sp. gr. of 1.015. It is insoluble in water, but readily soluble in alcohol and ether. When melted, apiol requires weeks or even months to become perfectly solid, but from solution in alcohol the original crystals can be readily obtained. The analytical results of various chemists find their simplest expression in the formula $C_{12}H_{14}O_4$. The author's paper also treats of the various products formed by the action of concentrated acids and alkalies. Ph. J. Trans., Feb. 24th, 1877, p. 693; Ber. Chem. Gess. 1876, p. 1477.

Apiol, Cheap Method of its Preparation.—L. Wolff states that when powdered parsley seed is exhausted with petroleum benzin, and the liquid is spontaneously evaporated, the residue consists of apiol, fixed oil, and wax; upon treating this mixture with strong alcohol, the apiol alone is dissolved, and may be completely sepa-

rated by repeated washings. The alcoholic solution leaves upon evaporation *true apiol*, corresponding in every respect with the product obtained by the very expensive method of Joret and Homolle. The author finds that apiol can be very acceptably dispensed either dissolved in essence of peppermint or in the form of an emulsion. A. J. Ph., Jan. 1877, p. 2.

Piperin and Chavicin.—R. Buchheim has obtained these two principles by washing the alcoholic extract of black pepper with water and treating it with ether. The residue was treated with a little potassa to remove an acid resin, dissolved in alcohol, decolorized with animal charcoal, and repeatedly crystallized from petroleum-benzin. The *piperin* thus obtained was in nearly colorless quadrangular prisms, which in alcoholic solution had a peppery taste. The ethereal solution was agitated with a little potassa solution to remove chlorophyll, fatty acids, and resin, the ether distilled off, the residue dissolved in alcohol, treated with animal charcoal, and evaporated. By repeatedly dissolving it in ether, the piperin was entirely removed, and a little petroleum-benzin separated the last portions of fat. *Chavicin*, so obtained, is in form of a yellowish-brown mass of the consistence of turpentine, and has an extremely acrid pepper taste; its solution, boiled with potassa, yielded an alkaline distillate, which proved to be *piperidina*, while the residue in the retort, after dissolving in water and acidulating with hydrochloric acid, yielded *chavicic acid* as an amorphous resinous mass.

Piperin may be regarded as a piperidina (NHC_5H_{10}) in which one H is replaced by piperic acid, thus: $NC_{12}H_9O_3.C_5H_{10}$, and chavicin may in like manner be viewed as a piperidina in which one H is replaced by chavicic acid. Neither chavicin nor piperin yield salts with acids. A. J. Ph., Oct. 1876, p. 467, from Ph. Centr. H., No. 35, 1876.

Emodin, Presence in Frangula Bark.—C. Liebermann and M. Waldstein exhausted *old* frangula bark with dilute solution of soda, precipitated the liquid with hydrochloric acid, again boiled the precipitate with soda, reprecipitated with HCl, dried, and repeatedly crystallized it from boiling absolute alcohol. The crystalline substance was then boiled with dilute sulphuric acid, whereby a glucoside was removed, and it was then again crystallized from alcohol or from glacial acetic acid. From the latter it was obtained in the form of orange-colored silky needles, containing acetic acid and water, both of which are expelled at 140°C. (=284° F.), the crys-

tals becoming opaque. Ultimate analysis proving the composition of the crystals to be $C_{15}H_{10}O_5$, their identity with emodin from rhubarb was further proven by the solubilities, form of crystals and color of alkaline solutions, and general reactions. The *frangulic acid* of Faust differs in some respects from emodin; it is not impossible that frangulic acid may be contained in the recent bark and gradually converted into emodin by oxidation. A. J. Ph., April, 1877, p. 173; Ber. Chem. Ges., 1876, 1775.

Betulin, Preparation and Characters.—U. Hausmann has obtained this principle from the light corky layer of the European birch bark, by first exhausting the bark with hot water, then making an alcoholic decoction, precipitating this with alcoholic solution of acetate of lead, heating the mixture to boiling, and precipitating the hot filtrate with carbonate of ammonium. On cooling, it formed a crystalline magma, which was pressed and purified by repeated washings with little ether and recrystallizations from hot alcohol. Betulin forms long colorless prisms, compressible to a shining felt-like mass, is easily rubbed to powder between the fingers, inodorous, tasteless, fusible at 250° C.,—corrected, 258° C. (= 482° and 496.4° F.),—and partly sublimes in thin needles. It is soluble in alcohol, ether, benzol, and chloroform, is insoluble in water, has the composition $C_{36}H_{60}O_3$, and forms with acetic anhydrid betulin-diacetate, a crystallizable ether. By dry distillation, oily products are obtained, which possess in a high degree the characteristic odor of Russian leather. A. J. Ph., Dec. 1876, p. 540; Ann. Chem., vol. 182, pp. 368, 380.

Cathartic Acid.—According to Dr. F. Witte, cathartic acid containing about 4 per cent. of ash constituents may be obtained from senna, and such is recommended by him as a substitute for senna. It may be given to adults in doses of 0.25 to 0.4 gram; to children from 0.12 to 0.2 gram. The product is in form of powder, readily soluble, and tasteless. Ph. Centr. H., Aug. 17th, 1876, p. 284.

Sclerotinic Acid.—This substance, which Dragendorff found to be the active constituent of ergot of rye (see Report, 1876), is recommended by Dr. F. Witte in lieu of the usual preparations of ergot. Its pulverulent character and ready solubility in water render it particularly applicable for medicinal application, and it is specially recommended in the form of subcutaneous injection. Internally given it possesses the advantage over ergot or its preparations that it can be accurately dosed, an impossibility with the last-named

medicaments. It is injected hypodermically in quantities of 0.04 to 0.05 gram, dissolved in 5 times its weight of water. While perfectly stable in the dry state, it readily undergoes change in aqueous solution, for which reason such solutions should not be kept more than two or three days. Ph. Centr. H., Aug. 24th, 1876, p. 293.

Coumarin.—L. v. Cotzhausen obtained from 1 lb. tonka beans 117 grs. of pure coumarin by extracting them with ether, evaporating, and recrystallizing the impure coumarin obtained repeatedly from alcohol. By substituting petroleum-benzin for ether, he obtained somewhat less, but he recommends it as a substitute for ether as being more economical. In a similar manner he obtained coumarin from the dried herbs of Asperula odorata, Lin., Melilotus officinalis, Pers., Liatris odoratissima, Willd., and Galium triflorum, Mich. The author proposes coumarin as an ingredient in the following preparations:

Extr. New-mown Hay.—Coumarin, gr. xij; essence of rose, ʒss.; cologne spirit, ℥ij.

Extr. Millefleurs.—Coumarin, gr. x; oil of cinnamon, gtt. ij; oil of rose, gtt. iij; oil of neroli, gtt. v; oil of lemon, gtt. xv; tincture of musk, gtt. xv; tincture of benzoin, gtt. xx; cologne spirit, ℥ij.

Extr. Tonquin Musk.—Musk, gr. x; cologne spirit, ℥iij. Digest, filter and add oil of neroli, gtt. j; coumarin, gr. xij; extract of vanilla, ʒij.

Sachet Millefleurs.—Tonka, ℥j; vanilla, ʒiij; cinnamon, cloves, of each ʒiv; rose leaves, ℥ij; orris root, ℥v; oil of mirbane, oil of lavender, oil of rose geranium, of each gtt. x; comminute by grating, cutting, or bruising, and mix.

May Wine Essence.—Coumarin, gr. iv; spirit of orange (made with freshly grated orange-peel), water, of each f℥xij; dissolve, mix, and if desirable, color with caramel. A few ounces are sufficient to flavor a gallon of Rhine or California wine. A. J. Ph., Sept. 1876, p. 405.

ALBUMINOIDS.

Albumen, Determination in Urine.—According to J. Stobnikow, urine containing albumen is diluted with water, until a sample, poured upon some nitric acid contained in a test-tube, produces still a faint white ring at the point of contact after the lapse of forty seconds. The number of *volumes* of water added to the vol-

ume of the urine—which may be taken as 1—is divided by 250, and the quotient will be the percentage of albumen in the urine. This relation has been established and confirmed by gravimetric determination. New Rem., May, 1877, p. 137, from Chem. Central. Bl.

Serum Sanguinis Exsiccatum.—In a previous paper Francis Vacher had given the particulars of some experiments made for the purpose of discovering an agent by means of which fresh blood-serum might be prevented from decomposition. He has since concluded that the best form for preservation is to subject it to complete desiccation in a drying chamber maintained at a temperature of 130° to 140° F., the process being in no way different from that observed in producing albumen mordant. Whereas, however, the latter is often made from stale serum which has been acidulated and "corrected," and always from the whole serum that can be separated, the dried serum made for the author has been derived from selected samples of *liquor sanguinis*, having only a trace of coloring-matter, but retaining the alkali and soluble salts normal to it. Removed from the evaporating-dishes it occurs in thin yellow flakes, bright on the surface and more or less curved. After being ground, the yellow color is nearly lost, and it appears as a fine light almost white powder, with a peculiar faint odor, and a salty, somewhat fishy, taste. It dissolves in cold water, but more readily in water slightly warmed. The serum has been obtained indiscriminately from the blood of sheep and oxen, but the yield of serum sufficiently pure to be suitable for medicinal purposes is, as regards either, very small. The average quantity of blood collected from a slaughtered ox is about 3½ gallons, or 35 pounds, but the clot holds so much serum that the whole quantity separable is often not more than 7½ pounds, and under the most favorable circumstances rarely exceeds 12½ pounds. So the average yield of an ox may be estimated at 10 pounds, and only one-third of this will clear enough to make a neat preparation. The average quantity of blood from a slaughtered sheep is about 4 pounds. In Watt's "Dictionary of Chemistry," the percentage of water in the serum of ox blood is stated to be from 90.8 to 91.5, in the serum of sheep from 91 6 to 91.8. An ounce of the preparation may, therefore, be considered equal to ten ounces of fresh serum.

From the author's further remarks it appears that, while serum has been used medicinally as an anthelmintic, evidence on this point is still wanting. The dried serum can be applied to all the uses for which the fresh serum is recommended, one of the most

important uses being the treatment of the subjects of emaciation, whether from phthisis pulmonalis, struma, or diabetes, especially adult patients. It is also useful for certain external applications; mixed sparingly with water and made into an emulsion with oil, it forms a suitable dressing for burns, etc.; mixed with a little water and an equal volume of spirit it may be used like collodion in cases of erysipelas, to prevent and diminish pitting in small-pox, etc. Ph. J. Trans., Dec. 16th, 1876, p. 494.

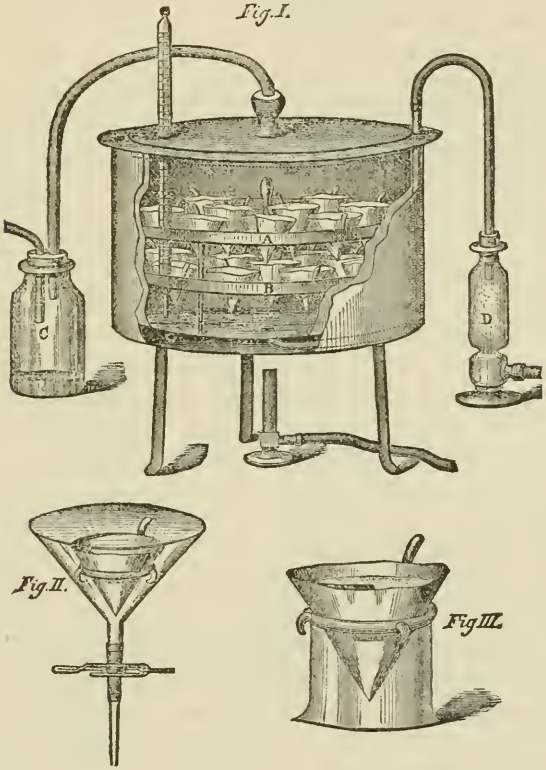
Milk, Determination of Solid Components.—L. Magnier de la Source has subjected the various methods recommended for the determination of the solid components of milk to examination, and finds that it is impossible to determine them by evaporation at a temperature of 100° C. (= 212° F.), even when operating on very small quantities. He recommends the method of Madame Brès, which consists in evaporating 1 gram of milk by exposure of a large surface (in a flat capsule); this yields satisfactory results if 3 per cent. is added to the residue remaining after 4–5 hours' exposure. The cause of error when evaporating at a higher temperature he finds to be in that the lactose is changed into caramel and ulmin-like bodies, and in the oxidation of the butter. Zeitschr. Öst. Ap. Ver., No. 1, 1877, p. 13.

Milk Analysis.—E. H. von Baumhauer read a paper on milk analysis at the Buffalo meeting of the American Association for the Advancement of Science, in which the following method and apparatus (Figs. 48, 49, 50) was recommended: A disk of copper, standing on feet, 10 c.m. in height (Fig. 48), is pierced with ten, twelve, or a larger number of round holes, having a diameter of 5 c.m., and placed at regular distances. In these holes are hung rings, 4 c.m. in diameter, made of glass rods, and having little curved arms of glass. In each of these rings is placed a filter-paper, folded in quarters, and filled with sand to ½ c.m. of the edge. Each filter, before folding, is to be 10 to 12 c.m. in diameter, and the sand is to be prepared by selecting that which is white and clean; digest it with hydrochloric acid, wash well with distilled water until the latter yields no trace of acid, then dry the sand, ignite it in a Hessian crucible, and while still red hot pour the contents from a height upon a clean stone, in order that the carbonized organic matter may be burned while falling through the air. It may then be preserved for use in well-corked, clean bottles. The filtering-paper must be prepared by washing with hydrochloric

acid and water, dried in a rising temperature up to 110° C. (230° F.), and preserved in a rubber-stoppered bottle.

Near each hole in the disk a number should be scratched, and in its centre a wooden handle is inserted by which to raise it. The heating apparatus consists of a copper bath with double walls,

FIGS. 48, 49, 50.



between which is placed paraffin. A tube connecting with a close-fitting cover communicates with a Woulff's bottle (*C*), in which watery vapor is condensed, and which is connected with a strong aspirator. The cover and disks also give passage to a thermometer, as shown in the cut. A copper tube, after following a tortuous course between the walls of the bath, terminates at one end in the middle of the air-bath, and at the other is connected at the close of the operation with the chloride of calcium or sulphuric acid apparatus, *D*. As many glass flasks and funnels are required as there

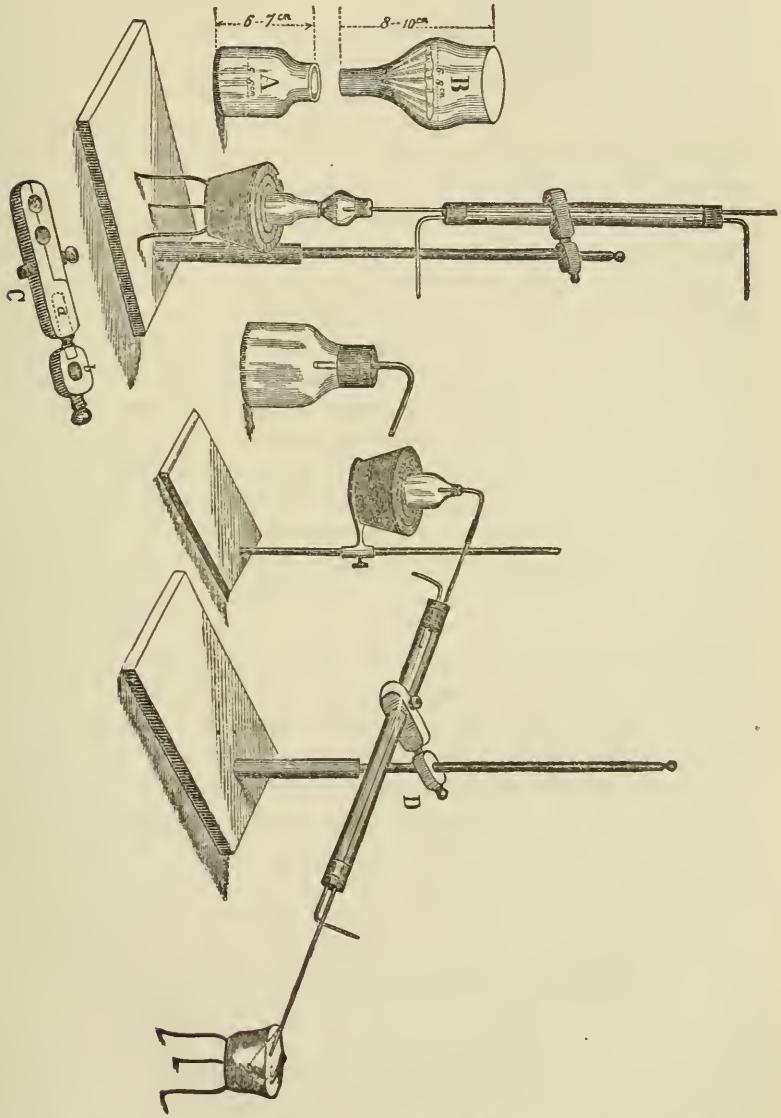
are analyses to be made; the capacity of each flask being 100 c.c., and indicated by a mark on its neck. The funnels (Fig. 49) have their edges ground, and are covered with watch-glasses. All these are numbered. The funnels are of such size that the filters hang free when placed on the rings (as in Fig. II). To the stem of each funnel is connected a caoutchouc tube, closed with a spring clamp. Finally, an equal number of beaker glasses are used as "desiccators," by placing in them triangles, upon which the filter-rings can rest. At the bottom of the glass is placed chloride of calcium, and the whole is covered with a head of India-rubber.

Having filled the filter with sand, they are placed on the support and heated for half an hour at 110° C. (= 230° F.); after cooling them in the desiccators they are weighed, a beaker from which the bottom has been cut (Fig. III), serving to support them during this operation. Then 10 c.c. of milk, at a temperature of 15° C. (= 59° F.), are, by means of pipettes, placed in each filter, care being taken to moisten the sand evenly, save the exterior edges. When all are charged the support is placed in the air-bath, and the temperature raised to 60° or 70° C. (140° to 158° F.), which heat is maintained so long as moisture is deposited in the Woulff's bottle. The aspiration is then moderated, and air, previously dried, is passed through the apparatus, which is then heated to 105° C. (= 221° F.) for a full half hour. The desiccation consumes four to five hours, the only need for care being to examine the thermometer. The filters are then left to cool for an hour in the receivers and weighed again, and the difference between the weighings gives the sum of the fixed constituents of the milk. If the point of the filter drips before 10 c.c. of the milk have been absorbed by the sand, it indicates an adulteration with water. In this case another filter must be used, and the addition made in proportion as the drying goes on. To determine the proportion of fat, the filters with contents are placed in the funnels, filled with anhydrous ether, and left standing half an hour. The ether is then drawn off and the operation is repeated until the ether runs limpid. After drying, the loss in weight will then indicate the proportion of fat. To determine the sugar, the same course is pursued, warm water being used instead of ether, and the water is collected in the flasks before mentioned. After being cooled to 15° C. (= 59° F.), and diluted to 100 c.c., the sugar in the solution is estimated by Mulder's test. New Rem., June, 1877, p. 172.

Apparatus for Milk Analysis.—H. Gerber has modified the usual

process for milk analysis, and uses for this purpose the apparatus illustrated by Fig. 51. 10 to 20 centigrams or grams of milk are

Fig. 51.



diluted with 20 or 30 volumes of distilled water in a large beaker. Very dilute acetic acid is added in drops, under constant stirring,

until the milk begins to form small flakes. The beaker is now set into water of 75° C. (= 167° F.), and allowed to so remain until the casein has separated in large masses, when it is filtered through a filter, previously dried and tared at 110° C. (= 230° F.). The serum is not only (as usual) boiled, but, in order to completely separate the albuminates, it is evaporated to one-fourth of its bulk. Any albuminates thus separated are added to the casein upon the filter, and the whole of it is washed with cold distilled water until the washings cease to be acid. The liquid portion is used to determine sugar. The author prefers to determine casein and albumen together as "milk albuminates," instead of estimating them separately. These albuminates, together with the filter, are now transferred to the funnel-shaped vessel, *B*, which is placed upon the flask, *A*, previously weighed air-dry. The coagulum is first washed with a small quantity of alcohol, part of which runs into *A*, and to which about three-fourths of its volume of ether is added. The apparatus is then placed upon the water-bath and connected with the upright (reflux) condenser. The ether must be made to boil only very gently, lest it might rise into the funnel in too large a quantity, or carry back with it some coagulum. The vapors of the ether are condensed in the upright condenser and fall back upon the coagulum, producing thereby an uninterrupted exhaustion. After some time a drop of the ether passing from the funnel, *B*, is allowed to evaporate upon blotting-paper, when a total disappearance of the stain indicates that all the fat has been extracted. The same condenser is now turned about its supporting pivot, *D*, so as to lie in an inclined position, *A* is connected with it, and the ether and alcohol contained in it are recovered by distillation. The residue in the flask, dried at 105° to 110° C. (= 221° to 230° F.), represents the fat; the remainder of the coagulum, dried at the same temperature, the casein and albumen. New Rem., March, 1877, p. 72, from Ber. Chem. Ges., 1876.

Peptone, New Researches.—The chemical relationship of peptone to fibrin has been the subject of various investigations. Maly and Thiry obtained results which led them to conclude that both substances differed but little, if at all, in chemical composition, while Möhlenfeld found in peptone considerably less carbon and hydrogen than in fibrin. In order to arrive at more decisive results, A. Kossel prepared a standard solution of peptone, which was divided into two portions, one of which (*a*) was treated with oxide of silver to remove chlorine. The percentage composition of the original

solution was found to be C 49.08, H 7.00, N 15.17, S 1.16, O 27.56; while that of the other portion (*a*) was C 45.93, H 6.71, N 15.45, S 0.9, O 31.01. It is evident, therefore, that the treatment by oxide of silver has caused a difference in composition, and both formulas show a greater discrepancy from the composition of albumen than has been found by former investigators. New Rem., May, 1877, p. 139, from Pflüger's Arch., 13, 309.

Mercuric Peptone.—Prof. H. v. Bamberger, who originated the albuminate of mercury (see Proceedings, 1876, p. 389), has since found that it is not merely difficult to prepare a clear and pure solution of this compound, but that it is moreover liable to spoil by keeping. He therefore replaced the albumen by a substance nearly related to it, namely, peptone. This latter body is easily soluble in water, resists the effects of heat, alkalies, and salts, may easily be filtered, and forms a compound with mercury without difficulty. To prepare the new compound, a 5 per cent. solution of corrosive sublimate and a 20 per cent. solution of chloride of sodium are prepared. 1 gram of meat-peptone is dissolved in 50 c.c. of water, and 20 c.c. of the solution of corrosive sublimate are added. This produces a cloudiness, which is removed by the further addition of 15 to 16 c.c. of the solution of chloride of sodium. The finished preparation contains 1 per cent. of mercuric peptone, and has so far proved very satisfactory. New Rem., Dec. 1876, p. 358, from Pharm. Zeit.

Peptone-forming Ferments, Occurrence in Plants.—E. v. Gorup and H. Will have examined the secretion of the pitcher plants, *Nepenthes phyllamphora*, Willd., and *N. gracilis*, Krth. The secretion of irritated glands, that is, of such pitchers which contained insects, was collected separately from that of non-irritated glands. The former liquid, which has an acid reaction, was found to dissolve fibrin, albumen, flesh, and legumin with ease, and to convert them into peptones; gelatin was likewise dissolved and converted into a non-gelatinizable substance; starch, however, was not altered by it. On the other hand, the secretion of non-irritated had a neutral reaction, and did not possess any digestive powers, but it acquired them in a high degree by the addition of formic, acetic, propionic, citric, or malic acids. The acid exudation of the pitcher leaves of these plants may therefore be considered as a solution of true *vegetable pepsin*. Just as pepsin alone, without the presence of an acid, is devoid of digestive powers, so is this vegetable exudation while

in a neutral condition. And when acidified, the latter is incapable of forming diastase, and has the above-mentioned peculiar effects upon gelatin, agreeing in these respects likewise with common pepsin solutions. New Rem., Nov. 1876, p. 324, from Ber. Chem. Ges.

Ferments contained in Plants.—C. Kosmann has observed the existence of a *natural ferment* in the buds of trees and young leaves of many plants, which is capable (1) of transferring cane-sugar into glucose, (2) of converting starch into dextrin and glucose, and (3) of resolving a glucoside, such as digitalin, into glucose and digitaliretin. The method adopted to show the presence of the ferment was as follows: The buds or young leaves were chopped and macerated in cold water; after twelve hours the liquor was strained off, filtered, and a portion warmed with Fehling's solution to see if any precontained glucose was present; 1.5 to 4.0 grams of sugar were then added, and the solution allowed to remain for some hours at a temperature of 18° to 30° C. (= 64.4° to 86° F.). Generally at the end of twenty-four hours the whole of the sugar was inverted, and a syrup of glucose could be obtained by evaporation, which had a powerfully reducing action upon the copper solution. Instead of sugar, starch-paste was sometimes used, which, when acted upon, was converted as above mentioned. No gas was evolved in these experiments, on the contrary, oxygen was absorbed; a microscopic examination of the deposits which occurred also revealed the presence of much organic life. The ferment was proved to exist in the following plants: Buds of *Ulmus campestris*, *Populus nigra*, *Quercus pedunculata*, and *Corylus avellana;* in the flowers of *Cornus sanguinea* and *Prunus spinosa;* in the young leaves of *Chelidonium majus* and *Digitalis purpurea.* From the latter he has extracted the ferment and purified it (see "Digitalis," elsewhere in this report). Ph. J. Trans., May 5th, 1877, p. 894, from Jour. de Pharm.

Diastase.—The following method for its preparation is given in A. J. Ph. (May, 1877, p. 236): Malt, of which the germ has attained two-thirds the length of the barley grain, and dried at 50° C. (= 122° F.), is ground, macerated at the ordinary temperature for five or six hours with twice its weight of water, then expressed, filtered, and the liquid mixed with twice its bulk of 95 per cent. alcohol. The precipitate is collected, spread in thin layers upon plates of glass, and rapidly dried in a current of air at a temperature of 45° C. (= 113° F.). 8.5 grams of diastaste, added to 200

grams of paste containing 10 grams of starch, yield a liquid which filters very readily, and decolorizes five times its volume of Fehling's solution.

Uric Acid, Detection.—Magnier de la Source recommends the substitution of bromine water for nitric acid (in the method based upon the final formation of murexid) as more delicate, and capable of detecting the presence of the slightest traces of uric acid. The sediment to be examined is triturated with water, a few drops of bromine water are added, and the mixture is evaporated on a water-bath. A brick-red deposit remains on the sides of the vessel, which dissolves in a drop of solution of potassa with handsome blue color, or with ammonia produces the characteristic purple color of murexid. An excess of bromine must be avoided in order to prevent the higher oxidation products of alloxan, prabanic, and oxalic acids. Ph. Centr. H., Sept. 28th, 1876, p. 338, from Rep. de Pharm.

Esbach's Ureometer.—A new apparatus for the estimation of urea has been devised by Dr. Esbach, of Paris, which is figuredand described in "Bull. Gén. de Thérapeutique." (See Figs. 52, 53.) The apparatus, which is called by the inventor *analyseur gasométrique*, consists of a generator, *C*, and a generator, *B*. The gas, which is given off by the reaction of the materials placed in the generator, is carried into the receiver through the tube, *A*. The generator has a bulb blown upon it at its upper third, is closed at the bottom, where it is connected with the receiver by a small solid glass bridge, and terminates above in a rather capacious neck, bearing a *very* accurately ground stopper. The latter is elongated, as shown in the cut, and has a knob-shaped end. When using the apparatus, it is immersed into a beaker of water —having at the bottom a contrivance into which the tube *B* may fit upright, so as to be immovable in all directions, except up and downwards—to such depth that the level of the water, measured by the lower line of the meniscus, stands at *A*. The reagent (hypobromite of sodium for urine) is

Fig. 52.

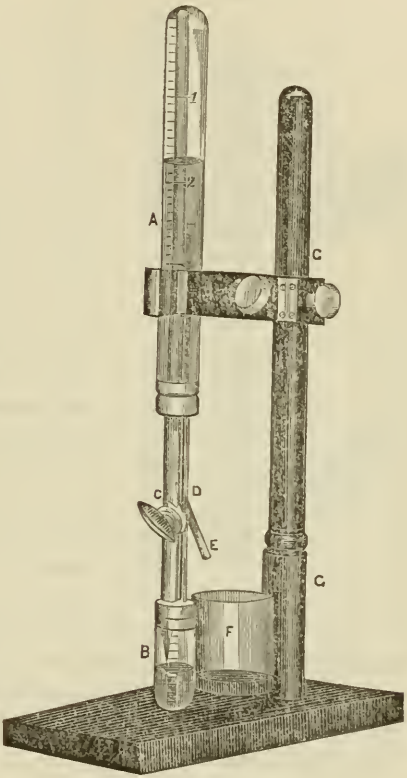
Fig. 53.

then poured, by means of a small glass funnel, into the generator, so as to fill the latter up to the commencement of the bulb; the necessary quantity of urine (for this apparatus, 1 c.c.) is placed into a small tube, the stopper removed and seized with the right hand, the tube inserted into *C* by means of the thumb and index finger of the left, but without letting go of it, then the knob-like end of the stopper placed over its orifice, and by a dexterous movement the tube pushed down, while at the same moment the ground surfaces of the stopper and neck meet and make the apparatus air-tight. The reaction begins at once with considerable violence, and in order to relieve the pressure, the immersed open end of *B* is lifted up in the water (but not out of it), whereby the suspended column of water acts as an aspirator. After about one minute the reaction is finished, the tube *B* is again depressed into the water until the level of the latter is the same inside and outside of the tube, and the degrees marked on the tube read off. These correspond to certain quantities of urea, determined with care experimentally, and properly corrected by means of a *baroscope*. This is a variety of barometer consisting of a curved tube which carries a bulb at one end, containing chemically inert gas and a drop of water above a column of mercury, thereby imitating the conditions which exist in the ureometer. The two instruments, *ureometer* and *baroscope*, must be used together, just as we use a thermometer in conjunction with a hydrometer, and the true percentage of urea is found by consulting the tables which accompany the instrument, and are calculated for all possible degrees which either of them are likely to indicate. New Rem., May, 1877, p. 140, from Bull. Gén. de Thérap., Feb. 15th, 1877.

A New Urinometer.—With a view of simplifying the operation of ureotomy to the utmost extent compatible with the necessary accuracy, M. J. G. Blackley, of London, has devised the form of apparatus represented by Fig. 54. It consists of two graduated tubes, a larger one, *A*, of about 75 c.c. capacity, and a smaller one, *B*, of about 15 c.c. capacity, closed by perforated India-rubber stoppers, through which pass the tubes *C* and *D*. *C* is the wider of the two, and is provided with a glass stopcock. Its lower extremity, drawn to a fine point, descends about half way into the tube *B*. *D* is a narrower tube, and ascends about half way inside *A*. *E* is a short, slightly bent tube, passing through the India-rubber stopper into the tube *A*, and serving as an egress for the superfluous contents of *A*, which are collected in the beaker, *F*, the whole being

supported by the wooden stand, *G G*. The method of using the apparatus is as follows: The tube *A* is filled with a solution of hypobromite of sodium, and its stopper inserted. Then 5 c.c. of the liquid to be examined are placed in the tube *B*, and its stopper, which has previously been adjusted upon the ends of the glass tubes, *C* and *D*, is inserted to the level of a scratch on the outside of the tube, the stopcock being turned off. The apparatus is then placed in position on the stand, and the stopcock gradually opened. The hypobromite solution flows down the tube *C*, decomposition takes place, and the gases evolved, ascending through the tube *D*, are collected in *A*. The superfluous hypobromite solution flows out through the tube *E* into the beaker, *F*. To complete the operation, the apparatus is removed from the stand, after placing the finger over the mouth of the tube *E*, and agitated for a few moments. It is then replaced, and after allowing time for the froth to subside, the quantity of gas collected is read off. After subtracting the small constant of air contained in the tube *B*, the remainder gives by calculation the quantity of urea present in the 5 c.c. of liquid examined. Under ordinary circumstances, the whole operation may be completed in five or six minutes. The tube *A* may be so graduated as to indicate at once the percentage of urea instead of c.c. of gas. The apparatus may be purchased from E. Cetti & Co., of Brooke Street, Holborn, London. New Rem., March, 1877, p. 75, from J. Chem. Soc., Nov. 1877.

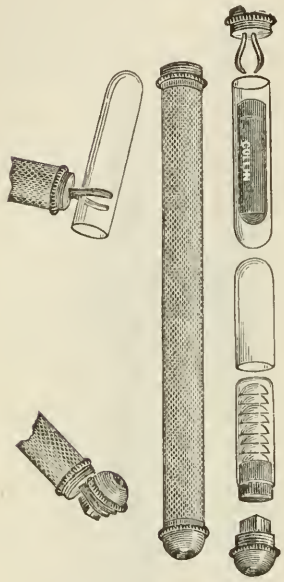
Fig. 54.



Pocket Case Uroscope.—Yvon describes, in "Rép. de Pharm.," (1877–8), a new apparatus for the examination of urine, which does

not take up more room than an ordinary caustic-holder, and may be carried about in a pocket case. The annexed cut (Fig. 55) explains the arrangement. A metallic tube is divided into two compartments, and closed at each end by a screw-stopper. The smaller compartment contains a test-tube for heating urine; within this tube is a small gutta-percha case or tube filled with blue and red litmus-paper. The stopper fitted to this compartment has an outer and an inner thread, and bears a clamp in its centre, which is pointed inside when the instrument is closed, but is reversed when using it to form a test-tube holder. The second compartment contains a spare test-tube, and another tube closed with a rubber stopper, and containing pieces of caustic potassa. The metallic stopper of this second compartment contains a small microscope of sufficient power to examine urinary deposits. This instrument is intended to be inserted into the clamp of the other stopper when using it. The practitioner will be enabled by means of this convenient arrangement to examine the alkalinity or acidity of urine, to search for albumen or for sugar (by means of potassa), and to examine urinary deposits. New Rem., March, 1877, p. 71.

Fig. 55.



REPORTS OF COMMITTEES.

REPORT OF THE COMMITTEE ON THE DRUG MARKET.*

FOR THE FISCAL YEAR ENDING JUNE 30TH, 1877.

SINCE this is the first meeting the American Pharmaceutical Association has ever held in the Dominion of Canada, it seems fitting that the report on the Drug Market should embody some information in reference to the Canadian drug market as to its sources of supply and also the general quality of the drugs used.

There are a large number of native American drugs that are indigenous to Canadian soil, but not many of them are utilized; either they do not grow in sufficient abundance to make their collecting a paying business, or otherwise our people are unwilling to work as cheaply as collectors do in other localities, hence the business in this department is quite limited.

Podophyllum is very abundant throughout Ontario, and the bulk of the root used in the Dominion is collected here, the usual price paid to the collectors being from 5 to 6 cents a pound.

Elm bark, although not so plentiful as formerly, is still gathered in considerable quantities, but there is not very much attention paid to the curing of it, and on this account we seldom see samples as white and clear as many of those brought from the United States.

Wild cherry bark is in fair demand, and is usually obtainable in quantities at from 5 to 6 cents per pound.

Taraxacum is in limited supply and always finds a ready sale at from 12 to 13 cents per pound.

The following articles are all collected in limited quantities: burdock, yellow dock, elecampane, prickly ash bark and berries, balm of Gilead buds, bethroot, bitter-root, boneset, bogbean, cat-

* Read at the Fourth Session.

nip, comfrey, elder-flowers, goldthread, horehound, white pond lily, lobelia herb, life-root, motherwort, milkweed root, white oak bark, peppermint, pleurisy root, poplar bark, pokeroot, raspberry leaves, skullcap, skunk cabbage root, spearmint, spikenard, stramonium, wild turnip, wintergreen leaves, American sarsaparilla, and yellow parilla.

Senega is not uncommon in the neighborhood of London, but is seldom found in sufficient quantities to be worth while collecting; small parcels are, however, occasionally offered. *Conium maculatum* is very common in the same locality, and is gathered in considerable quantities. *Hyoscyamus* occurs in many localities in Ontario, but notably in the vicinity of Toronto, where it has become, in many situations, a common wayside weed, but as yet has not been much utilized. *Tansy*, *wormwood*, *hyssop*, *rue*, and *sage* are cultivated in gardens, from which source much of what is sold in the drug stores is supplied.

Many of the native articles are not offered at prices to compete with the collectors of the South and the West, hence the bulk of our supplies comes from the United States. A large proportion of the whole is obtained in the New York market; those who are wedded to the convenience of having their things in ounce and other small packages patronize the Shakers, while the remainder is procured chiefly in North Carolina and Cincinnati.

Our tariff, in reference to these goods, is a rather remarkable one. Medicinal roots of all kinds are admitted free of duty, while the upper portions of medicinal plants, stems and leaves, are chargeable at the rate of 17½ per cent., and when the whole plant is imported, root and top, the dutiable upper part carries the free root with it into the dutiable column, the whole being subject to 17½ per cent.; why this distinction should be made between the root and the top of the same plant is not easy to divine. The admission of medicinal roots free, giving as it does the United States collector free access to the Canadian market, naturally interferes, to some extent, with the development of this department of home industry.

The grinding and powdering of drugs is extensively carried on in Canada, almost every large wholesale house having its own drug-mills. This is partly due to the fact that nearly all the wholesale drug houses are large dealers in white lead ground in oil, and to enable them to compete successfully with their rivals they require mills for the purpose of grinding their white lead. Other induce-

ments towards milling are found in the tariff. Cream of tartar, in crystals, is free; if powdered it pays 17½ per cent. duty. As already mentioned, medicinal roots of all sorts are admitted free, but if ground or powdered they are liable to a similar duty, an arrangement which gives a considerable margin of profit to the drug grinders, and results in a full supply of Canadian powdered drugs.

Canada Balsam.—This article is largely collected in the province of Quebec, where the *Abies balsamea* grows in great abundance. It is gathered there not only in quantities sufficient to supply the needs of the Dominion, but also to export to a sufficient extent to form an important article of commerce. The writer is indebted to the kindness of Mr. W. E. Brunet, chemist, of Quebec, who is a large dealer in this balsam, for the following details in reference to the collecting of it:

The whole family of balsam gatherers go into the woods in the Laurentine Mountains, at a distance of from seven to ten miles from the villages. There they encamp for two months, their baggage consisting of canisters, packages of pork, flour, a stove, and bed-covering. The mother remains in the camp to do the cooking and to strain the gum, and it is she who transports it, upon her back, in canisters of 5 gallons each to the village, where she sells it at the rate of $1.20 a gallon in exchange for flour and pork, which, on her return, she carries also on her back, to the camp. The father, with his boys, goes to pierce the trees, each furnished with a small can with a tube proceeding from it at the top. (See Fig. 56.) This tube is of iron, sharpened, and with this portion of the instrument the blisters of gum are pierced, one by one, the liquid flowing down the tube until the vessel is full. The children mount into the branches while the father works about the lower part of the tree. A large balsam tree, rich in gum, will yield as much as a pound of balsam; but one with another the yield of each tree is not usually more than eight ounces. The father, with the help of two children, can gather from sunrise to sunset a gallon of balsam, but the man who works alone has done a good day's work when he has collected half a gallon.

FIG. 56.

One cannot gather the balsam when it rains, or even on the same day, for the branches let fall drops of water, which, mixing with the gum, renders it milky and unsaleable. The collection of the balsam is made from the 15th of June, or about the time that the snow disappears from the mountains, up to the 15th of August

or 1st of September, the date when the snow usually begins to fall, or the weather turns cold and the gum no longer flows. Near the villages and upon partially cleared land it is gathered in May, but this is only in small quantities. It is only the poorest inhabitants and the Indians who do this business. There has been gathered in the mountains nearly 3000 gallons this year; the largest crop ever gathered was 5000 gallons. A tree should not be pierced two years running, and requires two or three years rest before being tapped again, and then it always yields very much less than the first time.

Spirits of Turpentine and *Rosin* were made here during the time of the civil war in the United States, when prices ruled high. They were prepared from our common red pine, *Pinus resinosa*, which grows in abundance in the northern counties of Ontario. The turpentine obtained from this source, although not identical with that made from the *Pinus palustris* and other pines of the South, yet it served as a convenient substitute in the various uses to which that article is applied in the arts. At the close of the war, when Southern turpentine resumed its old figures, this manufacture in Canada was abandoned, because it was found impossible to produce it at a price to compete with that from the South.

Castor, one of the few remaining of the once numerous class of officinal animal substances, is collected in Canada, chiefly on the Upper Ottawa River. Neither the supply of this drug nor the demand for it is anything like as great as formerly.

Ergot.—In some portions of the district lying between Toronto and Kingston rye is much cultivated, and in seasons favorable for the production of ergot, this substance finds its way in considerable quantities into the Canadian market from this source. The supply, however, is fitful, and is necessarily supplemented either by importations direct from Europe or by purchases in the New York market.

Essential Oils of Peppermint, Cedar, and Hemlock, are distilled in limited quantities, but although the supply of material for the preparation of some of them is unlimited, the quantity of oils of Canadian produce has usually been insufficient to meet the demand. Other American essential oils are purchased chiefly in New York. Those of European manufacture are imported mainly from the localities where they are produced.

Castor Oil.—East Indian is commonly purchased in Boston in bond, while Italian is brought chiefly from the London market.

The writer has not, to his knowledge, met with any castor oil in the Canadian market of United States manufacture.

Formerly a very large proportion of the other crude drugs used in Canada were imported from Europe, but since so large a number of these articles have in the United States been placed upon the free list, much of this trade has been diverted to New York, for since goods entering Canada from England are chargeable with the same duties as those from the United States, the nearer market has a decided advantage, as from thence supplies can be so much more quickly obtained, which enables the dealer to carry on his business with smaller stocks. Nevertheless, a considerable trade in this department is still yearly transacted in the London market and in the markets of Germany, partly the result of business connections long established, and partly because the foreign drugs obtained from the United States have not been so uniformly good as those imported from Europe.

In chemical manufactures Canada is steadily progressing. There are several establishments for the preparation of mineral acids. In London, Ontario, there are extensive sulphuric acid works, and others at Brockville, Ontario ; in both localities, I believe, the acid is made from iron pyrites of Canadian production. In the Brockville works muriatic and nitric acids are also made. The chemically pure acids, for which there is but a very limited demand, are brought chiefly from Great Britain. Acetic acid is also purchased in the same market.

Chloroform of good quality is manufactured in large quantities by Messrs. Lyman Bros., of Toronto, yet for the purpose of inhalation there exists in many localities so strong a prejudice in favor of Duncan & Flockhart's that this brand is chiefly relied on for that purpose. A considerable quantity of German chloroform is also imported from Merck, of Darmstadt, and other German makers. There is very little chloroform brought from the United States.

Lyman Bros. also manufacture sulphuric ether on a large scale, for druggists' and photographers' uses, nitrate of silver, and many other chemicals.

The *Sweet Spirit of Nitre* in the market is, I believe, entirely supplied by Canadian makers, mainly by Kerry, Watson & Co. and Evans, Mercer & Co., of Montreal, and by Lyman Bros., of Toronto. Much of this article found in the market is good, but a large proportion is inferior, most of the dealers keeping several

grades. The poorer qualities are made with methylated alcohol, which gives them a peculiar and unpleasant flavor, and sometimes this is weakened and cheapened by the addition of water. These lower grades are professedly sold for veterinary purposes, but in practice they often find their way into physicians' prescriptions and into the hands of physicians themselves, some of whom, I regret to say, pay more attention to the prices of the articles they purchase than they do to their quality; nevertheless, it is a pleasing fact that we have a large number of worthy physicians in Canada, and their numbers are increasing, with whom the welfare of their patients is paramount to all other considerations.

Liquor Ammoniæ Fort., which has until of late been imported almost entirely from Great Britain, is now being made of good quality in Montreal.

The great bulk of Canada's supply of chemicals comes from Great Britain. Many of our people are strongly prejudiced in favor of English chemicals, and this prejudice is perhaps stronger among physicians than among druggists, and is very difficult to remove, for most of our doctors are very conservative in matters of this sort. It is doubtful if you could find an ounce of quinine of United States manufacture in half a dozen stores in the Province. Almost every customer wants Howard's, but some are willing to take Pelletier's if offered a little lower in price. With the experience of nearly a quarter of a century behind the counter, the writer does not remember having Powers & Weightman's called for more than two or three times.

Some of our wholesale dealers will sometimes buy bismuth preparations, bromides, iodides, and occasionally other chemicals, from manufacturers in the United States, but in the great majority of cases they find that their customers prefer those of English manufacture, even at advanced prices. Howard's, Huskisson's, and Morson's goods are chiefly used, Howard's holding usually the highest place in public esteem. One thing which has, perhaps, helped to prejudice our people against preparations from the United States, is the class of folks who most frequently visit our druggists with articles for sale. They are mainly vendors of essential oils, many of them sharpers, with smooth tongues, and void of conscience, who occasionally entrap the unwary in the most merciless manner. As an instance—not long ago a friend of mine in the trade bought a can of very nice oil of sassafras, at a moderate figure, from one of these wandering salesmen, but found some

months afterwards, when sales had decreased the stock, that the lower third of the tin was filled with an adulterant that looked like water. Samples of oil of peppermint with adulterations amounting to half their bulk are not uncommon, the adulterant being usually a mixture of castor oil and alcohol. Such experiences as these tend to lead many of our people to believe that there is not much reliance to be placed on articles coming from the other side of the line, but this feeling is lessening, and will, doubtless, disappear as our pharmacists become better acquainted with the large number of honorable dealing wholesale traders and manufacturers, which are now to be found in most of the large cities of the United States. This meeting of the Association will, I am sure, do much towards removing these prejudices.

Camphor.—Although the feeling in favor of English refined camphor in many places is strong, yet the American is, in numerous instances, taking its place, being offered at lower figures.

Glycerin.—Price's formerly held almost undisputed sway in the Canadian market, but of late years the cheaper glycerin of German manufacture, especially Sarg's and Merck's, have almost driven it from the field; cheaper English-made glycerin, which competes in price with the German, is also freely sold, and occasionally some lots from United States manufacturers find their way into our market.

Solid extracts are imported almost entirely from England.

Fluid Extracts.—The market is fully supplied with homemade articles in this line, produced by several manufacturers.

In consequence of the very high prices which have of late ruled for sulphate of quinia, a comparatively large trade has been done in some of the other alkaloids from bark. Sulphate of cinchonidia, sulphate and muriate of cinchonia, and sulphate of quinidia are all being used more or less by the medical profession as substitutes, but especially sulphate of cinchonidia, which, as a tonic and antiperiodic, is gaining in favor wherever its effects have been closely watched; there is every probability that the demand for this article will become permanent. The salts of cinchonia sold are mainly English, which, in form of crystals and general appearance, closely resemble sulphate of quinia. Most of the sulphate of cinchonidia in the market is that of Powers & Weightman.

The quality of the drugs used in Canada, while varying much, is in the main good. Since the passing of the Pharmacy Act of 1871, which established the Ontario College of Pharmacy, and

prescribed examination and registration of chemists, the business even in country places is gradually passing out of the hands of grocers and unlicensed druggists, into those of a qualified class of pharmacists, who pay more attention to the quality of the articles they use than those did who formerly held the field; still there are a few articles sold which are notoriously bad. Spirit of nitre has been already referred to, and needs no further comment. Citrate of iron and quinine, as kept in the bulk of Canadian drug stores, is a very inferior article, containing often not more than from five to ten per cent. of citrate of quinia. This comes from England too, showing that even there all things are not as they ought to be. A sample of this substance came recently into the hands of the writer, with a remarkably honest label attached; at the bottom of it was printed, "This preparation contains one-third the quantity of quinine ordered in the British Pharmacopœia," but it is as difficult to associate outspoken honesty with transactions of this nature as to mix oil with water, hence this correct label shortly gave place to one marked simply citrate of iron and quinine, without note or comment.

We are also not without adulteration in other articles. Samples of iodide of potassium mixed with bromide have been sold; sulphate of quinia with muriate of cinchonia; the better grades of East India rhubarb, mixed with what is known as English rhubarb, etc., but such practices are mainly confined to few hands, where greed of gain and the desire to sell cheap overrides all principles of common honesty. The act recently passed in Canada in reference to adulterations, very similar in its provisions to that in operation in England, will, if strictly enforced, soon put an end to these nefarious practices, a result devoutly to be wished.

Before closing this portion of the report, reference should be made to a sample of pinkroot, kindly sent me by Dr. E. R. Squibb, of Brooklyn, in November last. This example was very fair to the eye and very clean, but was almost entirely free from that peculiar taste which characterizes the root when of good quality. Probably the inferior character of this article was due to its being gathered out of the proper season. Dr. Squibb says, "that he finds it very difficult to obtain good pinkroot of late years, and that the sample sent was a fair representation of the general character of by far the largest portion of the root to be met with in the market."

I have been favored by one of my esteemed associates, Mr. C.

F. G. Meyer, with the following interesting details in reference to the St. Louis drug market:

"The drug market in St. Louis has, in the main, been uniform and steady during the last twelve months. The principal article which has undergone a great change in price, is quinia. This article was sold by the manufacturers at this time last year, at about $2.30 per ounce, in September it advanced to $2.40, and gradually continued to advance until it reached the very high figure of $4.50 per ounce. A reaction, however, has taken place, and still lower prices are looked for.

"Quinine is of very great importance in this section of the country, nearly 200,000 ounces being sold in this market annually. The high price prevailing has, however, curtailed its consumption very much, and sulphate of cinchonidia has been substituted. This article has been used very extensively, and as near as I can ascertain, the amount of sales made in our city exceeds that of quinia by about one-third.

"St. Louis is the principal producer of the staple article of castor oil, which is consumed in immense quantities on this continent. In and near this city there are at least ten different castor-oil pressers; the reason for this is obvious, the castor beans being grown only in its proximity. The prices of castor oil have undergone considerable fluctuation during the year past. About the time that the new oil came into the market, say October 1st, 1876, oil was sold as low as 8½ cents per pound, but it soon reacted to 10½ cents, keeping on the advancing scale until it reached 15 cents. The crop of beans was not large last year, and much higher prices were looked for, but as holders were anxious to realize, the prices went down again, and at present oil can be bought at 13 cents. So far there is every prospect of a good crop this year.

"This city is also in possession of several chemical laboratories, one of them the most extensive in the Western or Middle States, in fact the only one that turns out a general line of fine chemicals, excepting quinia, morphia, and nitrate of silver, and the quality is considered of the highest standard.

"The amount of drugs sold in this market is about equal to that of previous years, but excessive competition has depressed prices, and hence profits are very small, while expenses are not reduced."

An excellent report on the New York drug market, by Mr. William H. Wickham, is also submitted.

WILLIAM SAUNDERS,
Chairman.

REPORT OF DRUG TRADE FOR NEW YORK CITY, FOR YEAR ENDING JUNE, 1877.

The drug trade, for the year ending June 30th, 1877, sympathized, in a measure, with the universal process of hardening which has been continuously experienced for the past ten years or more in all branches of business. The indispensable nature, however, of the medicinal portion of the stock of the druggist has tended to make the depression less seriously felt in his line than in many other pursuits.

The political excitement before and after the election last November occupied the attention of all communities in every section of the country, and considerably interfered with business transactions. In the spring, when hostilities between Russia and Turkey commenced, speculation took possession of the trade, impelling wholesale and retail dealers, and in many cases individuals unconnected with the trade, to invest largely in Turkish products, particularly opium and morphine, and advantage was taken of this forced activity to advance the prices of many articles entirely uninfluenced by the war. Reaction speedily followed, and values receded to about former figures.

With the almost universal prospect of large crops throughout our country, and a more settled feeling of confidence in the present administration, it would seem as if general trade should improve.

W. H. Wickham.

Opium.

July, 1876.—At the beginning of July there was but little inquiry, but speculative demand rapidly advanced prices, making a range during the month from $5.37½ to $6.12½, gold, duty paid, closing quiet but firm. Imports during July, through New York custom-house, 44 cases (6800 lbs.).

August, 1876.—Market opened firm, $6.37½, gold, duty paid, but the advance was not well sustained, and lots were offered at $6.25 without buyers. Imports, 119 cases (16,790 lbs.).

September, 1876.—Nominal price $6.12½, gold, duty paid, gradually declined during the month, and closed with small sales at $6, gold, duty paid. Imports, 200 cases (27,461 lbs.).

October, 1876.—Opened at $6, gold, duty paid. Reports of firmer markets abroad advanced prices of holders to $6.25. Dutch

Company buying at higher figures, and stocks being reduced, holders quoted cautiously at $6.50, which figure ruled at the close of the month. Imports, 7 cases (680 lbs.).

November, 1876.—Quiet, but firm, at $6.50, gold, duty paid, closing at the end of the month at $6.62½, with a few sales. The firmness of the Smyrna market served to stiffen the views of holders. Imports, 77 cases (12,195 lbs.).

December, 1876.—Nominally $6.62½, gold, duty paid, and ruled quiet during the month, closing weaker.

January, 1877.—Opened with small demand at $6.50, gold, duty paid. Sales were made during the month at $6.25, but price reacted at close to $6.50. Imports, 109 cases (16,577 lbs.).

February, 1877.—Holders asked $6.50, gold, duty paid. Price declined to $6.12½, and closed weaker at $6. No sales. Imports, 22 cases (2956 lbs.).

March, 1877.—Quiet at $6, gold, duty paid, market in favor of buyers; closed dull at $5.75. Imports, 33 cases (4971 lbs.).

April, 1877.—Opened at $5.75, gold, duty paid, without much inquiry until the middle of the month the news of the expected hostilities between Russia and Turkey caused considerable demand, resulting in sales of 30 to 40 cases at about above price. Much excitement was felt at the close of the month. Imports, 31 cases (4466 lbs.).

May, 1877.—Market was very much excited on account of Eastern war news, and speculative orders came in from all parts of the country for both large and small parcels. This excessive demand, embracing sales of about 350 cases, by its very impetuosity, rapidly forced prices up to $8, gold, duty paid, $8.65, gold, being asked for jobbing lots. The second week found the market in a nearly normal condition, price nominally $7, gold. The third week was quiet, at $6.50 and $6.25, gold, and lots to arrive were offered at lower prices, which was the case throughout the month, at sometimes the difference between prices for spot and future delivery being $1 to $1.50, gold, per lb. After some fluctuations in prices, the month closed with small sales, at lower figures, $6, gold, duty paid, for spot. Imports, 17 cases (2825 lbs.).

June, 1877.—Opened quiet, but steady, at $5.87, gold, duty paid; later, holders weakened to $5.62½ nominally, but offers of $5.50 would have been accepted. All buyers being well stocked, no sales were effected. At close of month $5.25, and even $5, would have bought. Imports, 276 cases (41,769 lbs.).

MORPHINE.

The demand in July, 1876, was fair at $4.25, manufacturers' prices, which were later advanced to $4.40 in sympathy with the higher prices of opium, and before the close of the month to $4.50. During August the demand was good and manufacturers advanced their prices to $4.75, notwithstanding the dulness of the opium market. This price was fairly maintained during August, September, and October. Outside lots stiffened a little during November, but manufacturers did not change their figures until March, 1877, when the price was reduced to $4.60, and a week later to $4.50. In April the demand improved for a few days, and $4.50 and $4.60 were asked by holders; manufacturers' prices remained unchanged until, later in April, a further reduction to $4.40 was made. In May, morphine followed the course of opium. The manufacturers were besieged with orders, accepting only those for legitimate demand, at prices varying from $4.50 to $5.25 for future delivery, but being unable to furnish on demand except in a very small way.

Sales from outside parties, amounting in the aggregate to over 2000 ounces, were made at various prices up to $7.25. The decline, however, was almost as rapid as the advance, and before the end of May, purchases were made at $5. Manufacturers' prices in June were $5, but outside parcels were procurable at lower rates.

QUININE.

In July, 1876, the demand for quinine was fair, and ruled steady at manufacturers' prices, $2.20, but in August manufacturers' prices were advanced to $2.30, and later to $2.40, with an active demand. English brands could be laid down at $2.45, which tended to prevent an immediate further advance. In September, considerable excitement was manifested in the quinine market; manufacturers, being largely sold ahead on contracts, could not supply the spot demand, and purchasers, both regular and speculative, forced the price up to $3.25, several thousand ounces being sold between $2.35 and $3; prices afterward receded to $2.60 and $2.65; manufacturers were nominally asking $2.50, but refused to deliver except on contract. In October, the market was $2.50 from manufacturers' and holders' hands. In November, because of the continued scarcity and high price of bark, on account of the disturbances in the bark-producing countries of South America,

manufacturers caused another advance to $2.70 and again to $3, at which latter figure the market was steady until March, 1877, when a further advance to $3.25 took place. During this month, manufacturers again withdrew from the market, and outside parties sold at $4.25 and $4.50, $4.75 being demanded by some. During April and May, prices fluctuated from $4 to $5; in fact, $5.50 was asked by some enthusiastic speculators. The price dropped, toward the end of May, to $4.50, and small arrivals of bark and anticipation of larger shipments declined the price in June to $4.25, at which figure the manufacturers are now (August, 1877) supplying a fair demand with few outside lots offering. On account of the deficiency in their supplies of quinine during the first six months of this year, our American manufacturers largely advertised the cheaper alkaloids of cinchona barks and created considerable demand for them, especially sulphate of cinchonidia. The experience of physicians in regard to the efficacy of the latter in comparison with quinine differs, and undoubtedly the question of price has had more to do with its introduction than its therapeutical merits.

Balsam Copaiba.—The price, in July, 1876, was 55 cents, with fair jobbing demand, but the exceedingly large and constantly arriving shipments throughout the year prevented the largest holders from controlling stocks, and the prices gradually declined to 36 cents, in May, 1877, then advanced to 40 cents, receding to 37 at the close of June. The fluctuations were numerous, due to repeated attempts of interested parties to control the market. Imports through New York custom-house, for year ending June, 1877, amounted to 212,826 lbs., a portion of which was reshipped to Europe.

Balsam Tolu.—Market, in June, 1876, opened dull at $1.50, but soon advanced to $2.50, and during September to $2.75, continued to rule between the latter figure and $2.15 until March, 1877, when larger arrivals depressed the market to $1.75, and price steadily declined until $1.20 and $1.30 were reached in June, 1877. Imports through New York custom-house for the year, 16,873 lbs.

Cantharides.—Russian cantharides ruled steady at between $1.10 and $1.25 until May, 1877, when the war excitement began, stocks were concentrated and holders were able to realize extreme prices, $1.50 and $1.75. Chinese cantharides have been more largely im-

ported, and large quantities have been substituted for Russian, the cost being about 25 per cent. lower.

Carb. Ammonia.—The range in prices has been from 13⅝ to 14¼, gold, excepting when the temporary scarcity in September enabled those holding small stocks to realize 15 cents, gold. The American manufacture enters into competition with the imported, but it is understood that the present prices are unremunerative.

Chamomiles.—Roman and Belgian chamomiles were very scarce and high, touching $1 and $1.25 for choice quality, during the fall and winter. German chamomiles ruled quite steady at 25 and 40 cents. The prospects of the crop of German chamomiles gathered in July are very flattering, and lower prices are expected.

Ergot.—The market for this article was very unsettled, and the fluctuations numerous and wide, from 50 cents to $1.10. Repeated efforts were made to buy up the stock in market without success. The supply was reported to be less than usual, but the high prices induced shipments from new sources, and stocks rapidly accumulated, forcing prices down to 50 cents in June, 1877. While the article was scarce in Germany, the Spanish supply proved adequate to fill the deficiency.

Gum Arabic.—The demand has been large and prices have ruled higher throughout the year.

Asafœtida.—Stocks were large in July, 1876, and market ruled at 12 to 16, as to quality, till November, when considerable interest was manifested, and views of holders advanced to 25 and 30, with some sales at 20 cents and 22½ cents. December found the market weaker at 18 cents and 20 cents; prices ranged from 15 cents to 18 cents until April, 1877, when 12 cents and 15 cents were quoted, after which there was some improvement, closing quiet in June, 1877, at 18 cents for prime.

Camphor.—Refined ruled steady at 26¾ to 27 cents until November, when scarcity of the crude caused refiners to advance their price to 30 cents, and in December to 33 cents; 32 cents to 33 cents continued to be demanded till April, when the market weakened to 31½ and 30½, stiffened again in May to 33 cents, and on account of the long delay in the arrival of a vessel containing a large quantity of crude, refiners could not supply the demand, and holders obtained 45 cents and 50 cents for immediate delivery, the demand being quite active. Refiners continued to take orders for future

delivery, and the high rates only existed a short time. The market quieted down to 32 cents in June, 1877, with downward tendency.

Shellac opened dull in July, 1876, at 40 cents for "D. C.," ruled higher in October and November at 43 cents to 45 cents, but gradually declined till, in June, 1877, sales of "D. C." were made at 25 cents.

Tragacanth.—White flake advanced on account of scarcity to 98 cents in the fall, and in the spring the excitement on account of the Eastern difficulties caused still more firmness.

Iodine.—During the fall and winter of 1876 the market was much depressed, iodine dropping to $3 for resublimed, and manufacturers offering iodide of potassium at $2.12 in bulk. In March, 1877, the price of iodide was advanced to $2.75, and later to $3.75, at which price it continued firm through June. This advance was caused by a combination of the French, Scotch, and Chilian manufacturers of iodine, the article having previously been sold below cost of production.

Bromine.—This article was in good supply, and ruled low during last fall and winter; bromide of potassium selling at about 50 cents until March, 1877, when an advance to 60 cents took place. In May a combination of the Kanawha salt makers was effected to limit production, and, large export orders for bromide of potassium coming into the market, manufacturers raised the price of the latter to 75 cents.

Castor Oil.—The market at the beginning of the year (June, 1876) was dull at 10½ and 11, advanced in October to 14 and 14½; in November, December, and January was held at 15 and 15½, and during the balance of the year fluctuated between 13½ and 15, closing at 14 and 14½. Shipments were freely made from the West, and the tables show that the importation of foreign beans was inconsiderable.

Oil of Bergamot.—This article opened dull at $4.10 and $4.15, gold, and gradually declined to $3 50, gold, till January, 1877, when considerable activity was displayed, and $4.75 and $5 were asked; the market weakened again, closing easy at $3.75 and $4, gold, variations in prices in the spring being from $3.60 to $4.25, gold.

Oil of cassia was comparatively steady throughout the year, the lowest point touched being 85 cents, gold, in October, and the highest price 95 cents in January and March; the supply was large.

Oil of lemon was in good demand, opening at $3 and $3.25, gold, and closing at $2.75 and $3, gold, fluctuating between $2.50 and $3.37, gold, being lowest in April and highest in January, February, and May.

Oil of peppermint ranged in price between $2.40 and $3.25 for can oil, being weakest in September, October, April, and May, closing at $2.75 for can, and $3.25 and $3.50 for bottled oil.

Oil of sassafras fluctuated between 45 cents and 58 cents, touching the former price in September, April, and June, and reaching the latter figure in December and January.

Oil of wintergreen generally ruled unusually low, below supposed cost of production. When price declined to $2.50 in December, several large lots were purchased, and $2.75 was demanded. In January the market was very much excited, considerable quantities changed hands, and holders demanded $3.75 and $4, expecting to realize $5; they were disappointed, however, for the small distillers continued to bring their supplies into market, and prices dropped in February to $2.75, and continued to weaken, closing quiet at $2.50.

Oil of rose commenced at $6.50, gold, and closed firm at $7.50, gold, with upward tendency.

Quicksilver opened at 55 cents, gold, declined to 49 cents, gold, in October, advanced to 55 cents and 60 cents, gold, in November and December, and gradually declined to 45 cents, gold, in June, with a spirt to 50 cents, gold, in April. The yield of the California mines, and the shipments from San Francisco, have been unusually large, but the low prices which have ruled are said to be unremunerative to most of the mines.

Ipecac root opened dull at $1, gold, declined to 97½ cents, gold, in August, recovered to $1, and continued steady till February, when holders asked $1.07 and $1.10, gold. In March speculation ensued, stocks became concentrated, and $1.40, gold, was demanded; a further advance to $2, gold, took place. The year closed dull at $1.75, gold.

Powdered Hellebore and Paris Green.—The usual scarcity and high prices of powdered hellebore and Paris green during the height of the *seasonable* demand, were more than ever noticeable this past year, especially in the latter article.

Santonin opened at $12.12½, advanced, on account of scarcity of wormseed, to $16.20 in December, but closed in June at $14.90.

Salicin advanced from 40 cents an ounce up to $2, the extraordinary demand exhausting the stocks.

Canary seed fluctuated from $5 to $1.95, and was the subject of much speculation; opened at $4.75 and $5.25, and closed at $2.50 and $2.75, the lowest point being, in April, $1.95 and $2; the range during May was from $2.75 to $4. The great source of supply was Holland, shipments from the Black Sea districts and Sicily being less than usual, but the deficiency was more than made up by the unusual quantities from Spain and Holland. Imports for the year ending June 30th, 1877, were 28,379 bags, against 15,996 bags during the previous year.

Hemp seed ruled very steady from $1.70 to $1.95 until March, when it declined to $1.50, closing at $1.85. Stocks were unusually large.

Borax, at the beginning of the year, was firm at 11 cents, and scarcely deviated half a cent per pound until June, when 9¾ cents could purchase. Nevada borax is now largely marketed, quantities being exported from San Francisco in the crude and concentrated forms. The low prices have increased consumption, especially for domestic purposes.

Oxalic acid has ranged from 9⅞ cents to 11 cents, gold, with small demand from the mills. Imports were below the average in amount.

Citric acid commenced the year at 72 cents, gold, advanced to 81 cents, gold, and closed at 76 cents, gold, generally ruling between 75 and 80, gold. American manufacturers are able to meet the demand, and the tariff gives them a margin of 10 cents per pound over foreign competition.

Salicylic Acid.—The demand has been active and the supply sufficient; the market has generally been steady at $3.50 to $4.00. An American manufacturer has been making it from oil of wintergreen; another firm, claiming a right under Von Hayden's patent, for the manufacture of this article for the United States, prevented, for some time, the importation of the foreign. Some doubts arising in regard to the validity of their rights under the patent, importations have been made and the test case has not yet been decided in the courts. Competition has lowered the price.

Cream tartar has ruled very uniform, about 29 cents to 30 cents, gold, for American crystals, and 33 and 34 cents, gold, for French; importations of the latter have almost ceased.

The demand for rare or comparatively newly introduced drugs

has been fair; in most cases the small quantities show the experimental nature of the orders. The stocks of *Coca* or *erythroxylon leaf* have increased, with considerable demand at lower prices. Reports of its value are encouraging. This drug deteriorates rapidly with age; the fluid and solid extracts of the green leaf seem to be the most reliable forms for preservation.

Damiana (Turnera aphrodisiaca) has increased in demand, but its value has not been definitely determined. *Eucalyptus* continues to command some attention and prices rule much lower.

Grindelia robusta appears to have made considerable impression upon the profession, and the demand is likely to increase. *Jaborandi* is in larger supply, with fair inquiry. *Yerba santa* is called for in a small way. *Guarana* (Paullinia sorbilis) has ruled steady, the supply having been sufficient for the demand. This article has become almost staple. *Sundew* (Drosera rotundifolia) is in small request. *Curare* (woorari) has been more inquired for, in an experimental way, as has also *Xanthium spinosum*. *Goa powder* and *Kava-kava root* have come into market in too small parcels to be widely distributed or have their merits well tested.

WILLIAM H. WICKHAM.

REPORT OF THE COMMITTEE ON ADULTERATIONS AND SOPHISTICATIONS.*

EFFORTS were made and much pains taken to procure contributions for this report from all parts of the country, and to this end a great many circulars were sent out, and numerous letters written; and withal, the chairman of your committee is pained to say that very few persons indeed have responded, so that the report will necessarily be made up chiefly from articles that have already been published on the subject during the past year.

The new articles will be first considered, followed by the gleanings from published papers.

Nearly all that has been written on the subject of adulterations and sophistications has pointed directly to commercial articles,

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* Read at the Second Session.

issuing from the manufacturers or wholesale dealers, and whilst these are of primal importance, the deficiencies in the preparations of the pharmacist must not be lost sight of. From previous observations of the writer he was led to believe that the preparations made in the average drug stores were far more deficient in strength or variable, taken as a whole, than all other articles sold in the same store. They are apt to be so from the nature of the preparations, but more especially so from the imperfect and varied manipulations.

Particular attention is called to this class of medicines, that good material in the first place may be selected to work upon, and then the working formula of the Pharmacopœia should be carried out to the letter if practicable, as this is the only way in which we can insure anything like uniformity in a large majority of our preparations; unless we had some easily applied and reliable test by which the finished product could be examined.

The matter of "improving" the various formulas of the Pharmacopœia, we think in practice should be discouraged. As instances of such so-called improvements, we have observed the dispensing of an aqueous solution of chloride of iron, for tinctura ferri chloridi, and a solution of a mixture of iodine and iodide of potassium in dilute alcohol for tinctura iodinii, claiming them to be better for the purposes intended. It is well enough to make known any improvements discovered, but not to change any of the processes or menstrua directed in the official preparations that can be avoided. The error being just as great in dispensing a preparation richer in active constituents than the standard, as in sending out deficient ones.

In the examinations below noted of a number of officinal tinctures, it is not claimed that the results obtained show accurately the comparative value of the active constituents in the several samples, but sufficient only to prove that there is undoubtedly a very great difference in the preparations from different stores; and that if the crude drugs were selected with ordinary care, and pains taken to follow the directions of the Pharmacopœia throughout, there could not exist the differences shown by the results given. And further, if the difference is so great in such simple preparations as the tinctures, how much more variable must be the fluid extracts and the other preparations requiring greater skill to make properly?

COMMERCIAL PRODUCTS.

Saffron.—Prof. W. M. Searby found "Spanish saffron" to be adulterated to the extent of 20 per cent. with chalk and glycerin. The sample had a fine appearance, and was purchased as a superior article at a high price.

Red Clover.—Mr. A. M. Linnett, of Newark, N. J., found a package of ten pounds of "Red clover" was composed almost entirely of white clover, a sample of which he inclosed.

Dandelion Root.—The entire substitution of chicory root for dandelion was noticed by Prof. Searby, put up in pound packages, and, by the label, purporting to come from the "Shakers," New York.

Antimony.—Mr. J. Calvert and Prof. W. T. Wenzell both examined samples of what was purchased from a wholesale house for "black antimony," but failed to detect in it the presence of any antimony whatever. Neither of the gentlemen, however, state the composition of the powder, which was partially soluble in muriatic acid with effervescence, and was probably the same as described at the last annual meeting of the Association, by Prof. Markoe, who examined samples of the drug he had purchased for black antimony, and which he found to be a mixture of powdered limestone and anthracite coal.

Sulphur.—A sample of sulphur was sent to the writer, which had been taken from a barrel purchased for "flowers of sulphur." On examination it proved to be powdered brimstone, and not a very uniform powder, some fragments were as large as pin's heads. It was very light in color, and over 18 per cent. of it was not volatilized by heat. The residue appeared to be earthy matter containing a carbonate. This led to the examination (in which Prof. H. C. Hanks kindly assisted) of a number of other samples of sulphur, obtained on the writer's order for "sublimed sulphur." Out of fifteen samples examined, there were only three that had been sublimed, the others being finely ground sulphur.

Nitrate of Potassium.—Mr. Charles Bullock, of Philadelphia, inclosed a sample he had received from a manufacturer, labelled "pure nitrate potash," which he found to contain a large amount of chlorine, and from the absence of soda salts in quantity, he thought chloride of potassium to be the impurity, which he believed to be present in the specimen to the amount of 20 per cent. Mr.

Bullock writes thus: "The discovery of native chloride of potassium in Germany has made this salt quite cheap, and if crystallized with the nitrate (in small crystals) would escape detection from the form of the crystals. This, however, may not have been an intentional adulteration, but the result of imperfect manipulation, in converting nitrate of sodium into nitrate of potassium by means of chloride of potassium."

Iodide of Potassium.—One-pound bottles labelled "iodide of potassium," and bearing the stamp of one of the best manufacturers, were found by Mr. Max Tschirner, to be filled with bromide.

Whisky.—The investigations on this subject were made by Mr. C. A. Mahoney, in the laboratory of Prof. H. C. Hanks, and under his immediate supervision. In the first place, twenty samples were purchased at different drug stores and saloons in all parts of the city, and it may be here noted that the samples from the drug stores were generally much better than the others.

Sample No. 1 had an acid reaction, contained 29.88 per cent. of alcohol, being a little more than 18 per cent. below the minimum standard of the U. S. P. It was contaminated to a considerable extent with fusel oil, and ethereal sulphates had been added to disguise the fiery taste.

No. 2 had a strong acid reaction, and contained 28.14 per cent. of alcohol. Grains of paradise had been added to give it a "bite." It was also contaminated with a good deal of fusel oil.

No. 3 contained 31.63 per cent. of alcohol. But slight indications of fusel oil. A fair sample, except being deficient in spirits.

No. 4 contained 27.5 per cent. of alcohol, and had a strong fiery taste from the fusel oil present, of which it contained nearly 1 per cent.

No. 5 contained 36 per cent. of alcohol, had an agreeable taste, and a mere trace of fusel oil. No adulteration found except a little burnt sugar used to color.

No. 6 contained 28.88 per cent. of alcohol, a large quantity of fusel oil, had a harsh astringent taste, and on evaporation yielded a residue of 1.06 per cent., which was found to be caramel and alum.

No. 7 identical with No. 6.

No. 8 contained 30.75 per cent. of alcohol, was contaminated with fusel oil, and adulterated with ether, burnt sugar, and 6.4 grains per gallon of alum.

No. 9 contained 29 per cent. of alcohol, was quite free from fusel oil, but contained a small quantity of alum.

Nos. 10 and 11 were fair samples, with the exception of being far below the standard strength.

No. 12 contained more spirit than any other sample examined. It, however, contained nearly 12 per cent. less alcohol than the minimum strength of the Pharmacopœia. This sample contained a very considerable quantity of fusel oil.

Most of the remaining samples, eight in number, were found to be more or less adulterated. Two of them contained acetate of copper, which, in one of the samples, amounted to 9.33 grains of the salt to the gallon.

"And the vitriol madness flashes up in the ruffian's head,
Till the filthy by-lane rings to the yell of trampled wife,
While chalk and alum and plaster are sold to the poor for bread,
And the spirit of murder works in the very means of life."—TENNYSON.

PHARMACEUTICAL PREPARATIONS.

Tinctures.—Samples of the first ten mentioned below were obtained from stores in San Francisco. A very marked difference was observed in the color of different samples of the same tincture, and noted in the table given, p. 357, as normal, meaning the intermediate color of that particular tincture, and dark or light, as the case might be, where a distinct difference was observed, and very light or very dark, where there was a great difference in the color. The figures in the same line denote the order in which the samples ranged from dark to light.

TINCTURE.		1	2	3	4	5	6	7	8	9	10
ACONITE.	Color, Specific gravity, No. grs. sol. ext. in 500 gr. meas.,	Dark, 2 .933 10.1	Normal, 3 .883 28.3	Light, 10 .838 15.9	Light, 9 .878 17.2	Light, 8 .835 13.2	Light, 6 .887 16.3	Light, 5 .836 13	Dark, 1 .915 20.3	Normal, 4 .888 14.1	Light, 7 .836 13
NUX VOMICA.	Color, Specific gravity, Grs. solid ext. in 500 gr. meas.,	Very light, 9 .810 6.4	Very light, 10 .892 5.05	Normal, 8 .834 15.2	Dark, 1 .839 8.1	Normal, 5 .834 16.2	Dark, 2 .880 18 5	Normal, 7 .821 7.1	Normal, 6 .847 17.7	Dark, 3 .861 14.6	Normal, 4 .841 16.2
DIGITALIS.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	.915 10.1	.951 13.15	.951 6.55	.947 16.7	.962 23.8	.958 19.2	.955 18.7	.951 13.1	.945 15.7	.963 25.3
VALERIAN.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Light, 8 .945 12.65	Light, 6 .947 13.5	Very light, 10 .915 4.9	Normal, 3 .954 17.2	Normal, 4 .947 13.2	Normal, 5 .347 14.6	Very light, 9 .957 10.1	Normal, 2 .945 12.1	Light, 7 .915 11	Dark, 1 .947 17.6
MYRRH.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Very light, 10 .836 21.3	Normal, 3 8.28 11.5	Normal, 7 .829 11	Normal, 8 .830 10.15	Very light, 9 .834 17	Normal, 5 .834 17.2	Normal, 2 .830 10.6	Dark, 1 .836 14	Normal, 4 .836 17.2	Normal, 6 .848 18.2
ORANGE-PEEL.	Color, Specific gravity, Grs. solid ext. in 500 gr. meas.,	Normal, 5 .951 20.5	Normal, 4 .963 18.2	Normal, 8 .944 11.6	Dark, 1 .932 23.3	Normal, 7 .957 24.3	Dark, 3 .960 26.3	No sample " "	Normal, 8 .891 13.2	Very light, 9 .925 20.5	Dark, 2 .962 26.3
CUBEBS.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Very light, 9 .910 5.5	Very light, 10 .889 19.2	Light, 7 .933 8.4	Normal, 3 .949 10.1	Light, 6 .938 10.6	Very dark, 1 .975 11.1	Normal, 5 .949 7.6	Light, 8 .937 10.1	Normal, 4 .929 11	Normal, 2 .949 10.15
GINGER.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Light, 8 .832 4.5	Light, 9 .824 3.3	Dark, 3 .870 4.55	Very dark, 1 .836 7.1	Normal, 6 .834 5	Normal, 4 .844 7.8	Light, 10 .824 2.5	Dark, 2 .841 7	Normal, 5 .848 4.05	Light, 7 .859 4.55
LOBELIA.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Normal, 8 .939 11.9	Dark, 1 .963 15.2	Dark, 2 .964 15.2	Normal, 5 .952 11.3	Normal, 4 .956 12.1	Dark, 3 .947 15.2	Normal, 6 .910 10.1	Light, 9 .941 9.9	Light, 10 .935 6.06	Normal, 7 .943 12
RHUBARB.	Color, Specific gravity, Grs. ext. in 500 gr. meas.,	Normal .959 28.3	Normal .959 20.5	Normal .957 16.2	Normal .964 22.2	Normal .955 19.2	Dark, 1 .963 36.4	Light, 10 9.47 16	Light, 9 .958 21.2	Normal .966 22.3	Normal .952 21.2

Mr. Albert M. Read, of Washington, D. C., communicated the following tabulated results of his examination of tinctures obtained from drug stores:

NAME.	NO.	SP.GR.	AMOUNT OF EXTRACT IN ℥j.	COLOR.
Tinct. digitalis, . . .	1	0.965	16 grs.	Dark green.
" "	2	0.945	17 grs.	Dark brown, with green tinge.
" "	3	0.945	13 grs.	" " " "
Tinct. aconite root, .	1	0.845	14 grs.	Dark reddish-brown.
" "	2	0.840	12 grs.	Light reddish-brown.
" "	3	0.838	11 grs.	" "
Tinct. nux vomica, .	1	0.841	12 grs.	Dark straw.
" "	2	0.831	10½ grs.	Light straw.
" "	3	0.827	10 grs.	"
Tinct. cubebs, . . .	1	0.946	4½ grs.	Reddish-brown (sediment).
" "	2	0.942	4¾ grs.	" " (clear).
" "	3	0.951	4¾ grs.	" " "
Tinct. orange-peel, .	1	0.960	18 grs.	" " (darker than dark sherry).
" "	2	0.962	21¼ grs.	" " " " "
" "	3	0.960	18¼ grs.	" " " " "
Tinct. rhubarb, . . .	1	0.958	9½ grs.	Very dark reddish-brown (muddy).
" "	2	0.962	10½ grs.	" " " (clear).
" "	3	0.973	9 grs.	" " " "
Tinct. valerian, . . .	1	0.967	8 grs.	Clear reddish-brown.
" "	2	0.970	7¾ grs.	" "
" "	3	0.964	8¼ grs.	" "
Tinct. myrrh, . . .	1	0.844	9 grs.	Clear, bright straw color.
" "	2	0.827	10½ grs.	" " "
" "	3	0.832	6½ grs.	" " "
Tinct. ginger, . . .	1	0.834	7½ grs.	Dark sherry.
" "	2	0.833	7¼ grs.	" slightly lighter than No. 1.
" "	3	0.833	8½ grs.	" slightly darker than No. 1.

The tinctures of digitalis and aconite were analyzed by C. E. Chidester, and the tinctures of ginger and orange-peel by J. J. Stafford, of Washington. The balance were done by Mr. Read.

Mr. J. Gordon, of Montreal, Canada, examined three samples of each of the beforementioned tinctures, which he obtained from stores in that city. Results as follows:

	COMPARATIVE COLOR.			SPECIFIC GRAVITY.			GRAINS OF SOLID EXTRACT IN 500 GRAINS MEASURE.		
Tincture.	1	2	3	1	2	3	1	2	3
Aconite, . .	Lightest.	Both alike.		.830	.852	.845	3.55	36.5	18.
Nux vomica,	Both alike.		Darkest.	.829	.840	.832	3.7	15.1	2.75
Digitalis, .	Darkest.	Both alike.		.952	.958	.943	14.2	9.5	8.9
Valerian, .	All are alike.			.953	.925	.953	9.5	8.75	9.75
Myrrh, . . .	Light.	Darker.	Darkest.	.835	.852	.837	7.5	35.5	28.5
Orange-peel,	Lightest.	Both alike.		.956	.954	.947	10.5	11.5	11.2
Cubebs, . .	Light brown.	Dark brown.	Light green.	.899	.951	.838	5.5	9.65	2.5
Ginger, . .	Same as 3.	Lighter.	Same as 1.	.829	.851	.827	1.5	10.25	7.2
Lobelia, . .	Lobelia.	Both alike.		.928	.952	.837	6.4	5.7	5.5
Rhubarb co.,	All are alike.			.962	.956	.930	28.2	16	11.5

Examinations of the following were made by Mr. James H. Bowman, London, Ontario.

"These samples were obtained from three of the leading drug stores in this city.—W. S."

	COLOR.			SPECIFIC GRAVITY.			GRAINS OF SOLID EXTRACT IN 500 GRAINS MEASURE.		
Tincture.	1	2	3	1	2	3	1	2	3
Aconite, . .	Varying from straw to sherry.			.882	.880	.856	13.7	8	14.3
Nux vomica,	Same in all.			.853	.885	.830	5.1	5.7	9.1
Digitalis, . .	Varying very little.			.948	.954	.952	14.9	22.3	21.7
Valerian, . .	Not varying.			.962	.945	.945	10.9	10.9	10.3
Myrrh, . . .			Much paler than others.	.830	.830	.827	18.3	11.4	9.1
Orange-peel,	Scarcely varying.			.950	.928	.934	17.4	14.9	15.4
Cubebs, . . .	Varying very little.			.833	.830	.834	10.3	11.4	11.4
Ginger, . . .	Light brown.	Light brown.	Dark brown.	.823	.865	.857	2	1.7	3.4
Lobelia, . .	Same.			.948	.962	.973	10.3	9.1	9.1
Rhubarb co.,	Much lighter than other two.	Same.		.962	.955	.962	21.1	18.9	16.

Mr. J. C. Wharton, of Nashville, Tenn., examined samples of the tinctures and gives the following results:

	COLOR.			SPECIFIC GRAVITY.			GRAINS OF SOLID EXTRACT IN 500 GRAINS MEASURE.		
Tincture.	1	2	3	1	2	3	1	2	3
Aconite, . .	1	1	2	.846	.837	.841	10.8	12	13.2
Nux vomica,	⅛ Greenish.	¼ Greenish.	¼ Brown.	.846	.865	.851	8.4	2.4	12
Digitalis, . .	25	15	30	.952	.961	.957	18	30.05	26.45
Valerian, . .	8	2½	15	.947	.942	.947	13.2	7.2	12
Myrrh, . . .	2	1	1½	.841	.837	.846	12	9.6	15.6
Orange-peel,	3	No sample.	No sample.	.933	No sample.		12		
Cubebs, . . .	4	7	6	.937	.937	.942	8.4	8.4	8.4
Ginger, . . .	3	1½	4	.870	.830	.832	7.2	2.4	4.8
	Slightly greenish.								
Lobelia, . .	2½	8	6 Slightly muddy.	.942	.940	.969	13.2	14.4	13.2
Rhubarb, . .	45	70	80	.928	.952	.959	14.4	21.6	16.8

Explanations: 1, 2, and 3, at head of columns, signify the different stores from which samples were obtained.

The numbers under the head of color, and below the figures 1, 2, 3, indicate, ⅛, ¼, 1, 2, 2½, etc., drops of tincture iodine (U. S. P.) diluted with f℥ij of alcohol in each case. This might easily be used in many cases to indicate the intensity of color of tinctures. In most of them the artificial color of the iodine imitation is so close as to defy distinction, one from the other. Sometimes the colors are not identical but of sufficient resemblance for comparison. The numbers under the head of solid extract are to represent the amount by weight obtained from 500 grain measures; that is, a bulk of tincture equal in volume to 500 grs. of distilled water.

I found that I could measure accurately small quantities, and also weigh them, by taking a small thin tube and drawing it out by means of heat to an exceedingly fine point at each end. The tube was weighed, then filled with distilled water and weighed again; thus I obtained the net weight of distilled water. By obtaining the weight of the tinctures similarly, and dividing by weight of water, the specific gravity was found. The solid contents were from same tube filled with tincture.

The tube was filled by suction, and, in some cases, to prevent getting the tincture in my mouth, I used a small piece of rubber tubing over one end. In using, the tube must be kept horizontal whenever both ends are open.—(J. C. W.)

Tincture of Opium.—Mr. G. E. Bacon, of this city, examined fourteen samples of this tincture with the results as follows:

No.	1 contained	$3\frac{2}{16}$	grains of	morphia in	f℥ij.	
"	2	"	$2\frac{1}{16}$	"	"	"
"	3	"	$3\frac{10}{16}$	"	"	"
"	4	"	$4\frac{1}{16}$	"	"	"
"	5	"	$4\frac{5}{16}$	"	"	"
"	6	"	1	"	"	"
"	7	"	$\frac{6}{16}$	"	"	"
"	8	"	$2\frac{7}{16}$	"	"	"
"	9	"	3	"	"	"
"	10	"	$4\frac{6}{16}$	"	"	"
"	11	"	$2\frac{11}{16}$	"	"	"
"	12	"	$2\frac{15}{16}$	"	"	"
"	13	"	$6\frac{11}{16}$	"	"	"
"	14	"	$4\frac{6}{16}$	"	"	"

Thesis.

Hydrocyanic Acid.—Mr. H. R. Harris, of this city, tested samples from retail stores which gave the following percentages of anhydrous acid:

U. S. P.	2.46	1.56	Scheele's.
1.40	1.29	1.67	4.86
1.72	2.	1.94	4.48

Thesis.

MISCELLANEOUS.

Coal Oil.—The following is from Mr. C. A. Mahoney: Kerosene, at ordinary temperatures, should give off no inflammable gases, and should extinguish as readily as water a lighted match plunged into it. It should be nearly colorless by transmitted and only slightly opalescent by reflected light. The temperature at which it gives off gases which ignite for a moment while the oil itself remains unaffected, is termed the flashing-point, and that at which the whole body of the fluid ignites, and burns until it is entirely consumed, its burning-point. Oil, to be perfectly safe to burn in an ordinary lamp, should not flash at a temperature under 120° F.

Sample No. 1. The oil was clear, its physical properties good. It flashed at 119° F. At 136° F. it took fire and burned until consumed.

This oil was of California manufacture.

No. 2. At the low temperature of 86° F. it gave off explosive gases, and at 89° burned fiercely. A lamp burning such oil would be dangerous at as low a temperature as 70°.

No. 3. Very turbid, and had a slightly milky color. It flashed at 91° F. and burned at 99°.

No. 4. Quite clear. It flashed at 104° F. and burned at 122°.

No. 5. Physical properties good. It flashed at 122° F. and burned at 144°. The best oil tested.

All the other samples—a dozen in number—procured at different stores, were found to be dangerous, with one exception. Their flashing-points were under 100°, varying from 88° to 94° F., and their burning-points only a few degrees above the flashing-point.

Respectfully,

EMLEN PAINTER,
Chairman Committee.

SUPPLEMENTARY REPORT OF THE COMMITTEE ON THE CENTENNIAL EXHIBITION.*

IT will be remembered that the committee appointed to report upon objects of interest at the Centennial Exhibition, at Philadelphia, issued a circular to the exhibitors in different parts of the world requesting them to forward useful information about their products on exhibition, the same to be used by the committee in compiling their report.

Many answers were received to this circular, and much valuable information imparted, but in many cases the exhibitors took occasion to insert nothing which would be useful or valuable, but filled their communications with the most liberal puffs of their various wares, and used frantic endeavors to impress the committee with their own individual greatness. As a consequence, selections had to be made, and care has been taken to exclude objectionable matter, and at the same time keep faith with all exhibitors who replied to the circular in the spirit in which it was tendered. When the report was finished last year, in consequence of the desire to have

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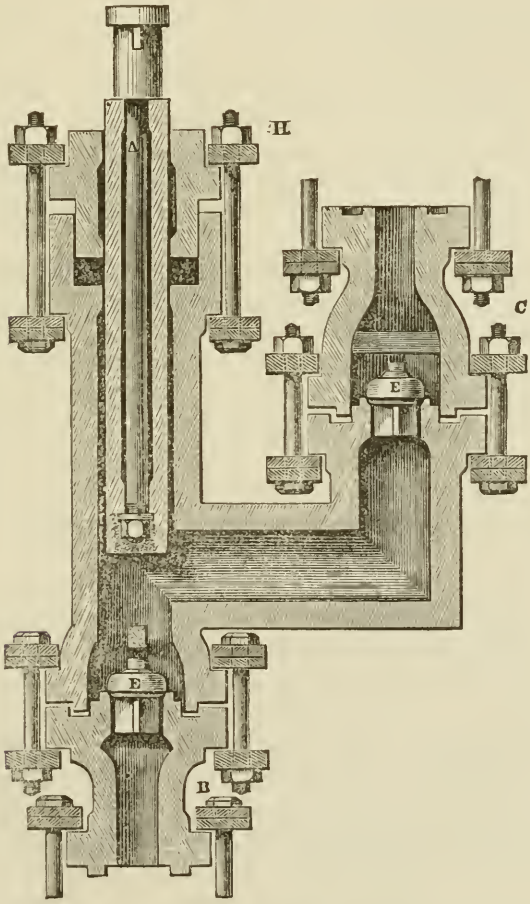
* Read at the second session.

the published Proceedings issued at the earliest moment practicable, and not having received answers from all exhibitors who were addressed, it was deemed best to publish as full a report as could be made at that time, and collect together the small number of replies that were yet to be heard from, and form a supplementary report; this was done, and is as follows:

Doulton's Improved Stoneware Force-pumps for Acids, Bleach, Alkalies, Vinegar, etc.—Below is presented a cut showing a sec-

FIG. 57.



tional view of a stone pump which was displayed in the interesting collection of Doulton & Watts's Lambeth Pottery, London. It

would seem almost marvellous that a piece of machinery, as complicated as this, could be successfully made out of stoneware, yet such is the skill of our English brethren in work of this kind, that it is no longer a novelty with them. Of course the value of the pump is largely dependent upon the accuracy with which the valves and valve-seats are ground and fitted, and the joints must fit perfectly tight; this requires much care and patience. The cut thoroughly shows the operation of the pump.

An interesting account of the bark of Alstonia constricta, exhibited in the New South Wales, Australian Department, by A. Armstrong, is deemed of value, and is hereby fully reported:

"The tree, from which the specimen of bark was transmitted to the Centennial Exhibition, at Philadelphia, is a native of the inland districts of the northern portion of Australia, its southern limit being about latitude 30. It is always found in dry districts, and always in ground near water, of which its presence is a sure indication.

"The residents of many districts in which the tree grows naturally, use a decoction of the bark as a cure for fever and ague, and near the southern limit of the growth of the tree I have frequently seen local residents use it as a tonic, and in these districts the common name given to it is Peruvian bark tree. In the northern parts it is called the 'Zuchardt tree,' in honor of the great explorer of that name, he having also observed that its presence was a sure indication of water."

The following botanical description is taken from the "Flora Australiensis:"

Alstonia constricta, F. Muell, 1, 57, iv, 170, a tall shrub or tree, attaining sometimes forty feet, quite glabrous. Leaves opposite, on long petioles, mostly oblong-lanceolate, but varying from almost ovate to narrow-lanceolate, acute, or acuminate, the primary veins distant, oblique, and not very prominent, three to five inches long. Flowers numerous, in corymbose cymes, either solitary and terminal, or two together in the forks of the branches, and shorter than the leaves. Calyx-segments ovate, almost acute, about half a line long, with a few minute and irregular glands at the base inside. Corolla-tube about one line long, the lobes about two lines long, glabrous, or slightly bearded inside at the base, the right-hand edges overlapping in the bud. Follicles from three to four inches to twice that length. Seeds linear, flat, or concave, pubes-

cent, four to six lines long, ciliate, with long hairs at the upper end, and shorter ones at the lower end.

From W. Irwin Grayling, Taranaki, New Zealand, the following information about Australian extract containing tannin and dye stuffs, will no doubt be useful:

Grayling's Extract of Towai.

The Towai, *Weinmannia racemosa*, is an indigenous tree, largely distributed over the hilly lands of New Zealand. The timber is enduring, which, added to its being an evergreen, causes the land upon which it grows to become extremely poor. The Towai is often to be met with four and five feet in diameter, and from thirty to sixty feet in altitude. On the lowlands the diameter does not exceed two or three feet. It grows chiefly in clusters, many stems springing directly from the same root. The bark can be removed with equal ease throughout the year; but it is only at one period, the spring, that the beautiful transition of color so indicative of the presence of tannic acid can be seen on the naked tree, the rapidity of the changes conveying a true idea of the value of the stripping before or after this season. On the removal of the bark the timber continues perfectly white, becoming of a dirty brown at the end of many days. Notwithstanding the snowless character of the New Zealand climate, nature appears to require her winter's rest, all vegetation for a short period at midwinter evincing no progress. The bark is loosened from the stem by the action of the rain and earth moisture, and not from the naturally assimilated juices of the plant.

Three different extracts have been formed; the first from the bark, which yields a series of extremely permanent colors, much brighter in character than those obtainable from the other kindred extracts, such as catechu, gambier, etc., etc.

The second extract is formed by acting on the sap timber; the result is not so highly colored as the first. The third is produced from the heart timber of the matured trees, and closely approaches in character the ordinary gambier and catechu of commerce.

Extra superior articles can be supplied by means of the vacuum process.

The extracts can be sent to market at the ordinary price of gambier, etc., etc.

Grayling's Extract of Hinau.

The Hinau, *Elæocarpus dentatus*, is a large forest evergreen tree, abundantly to be met with in most parts of New Zealand. The bark of this tree is used by the Maoris in dyeing with black their beautiful flax mats. The dressed flax is soaked with a hot infusion of the bark, and afterwards buried in the red iron mud so prevalent near the stagnant pools. This has evidently been formed by the action of the decomposing vegetable matter and moisture on the protoxide of iron that is so largely disseminated throughout the country.

The blacks thus produced have a great tendency to turn of a brown color. This in all probability is caused by the action of the large amount of potash, invariably met with in the bark of evergreen trees, reacting on the iron, the extract from the heart timber being much more permanent. The Hinau can only be considered of value as a dye, yielding yellows, buffs, and blacks.

Ernst Mack, of Reichenhall, Bavaria, writes under date of January 30th, 1877, that he exhibited the ethereal oil of *Pinus pumilio*, and the aqueous extract of the same. The latter preparation is used for medicating baths. Of the oil about 18,000 bottles, and of the extract about 3000 kilogr. are manufactured annually by this exhibitor. Bath preparations are said to be chiefly dispensed in response to physicians' prescriptions.

J. Zacherl, of Vienna, Austria, the manufacturer of mixed powders and tinctures, generously offers to donate to the American Pharmaceutical Association any amount of the Persian flowers and powder exhibited by him which it may see fit to select.

Heinrich Hænsel, Pirna on the Elbe, Germany, whose exhibit was noticed in our report of last year, claims to have discovered a method of rendering ethereal oils readily soluble in 30 per cent. alcohol, without producing any turbidity whatever. He terms the oils so treated *positiva*. They are said to possess numerous advantages for liquor dealers in the production of aromatized cordials. The *positiva* of the oils of caraway, cloves, and Mitcham peppermint are specially recommended by him to the attention of the pharmacists. They are claimed to have double the intensity or flavoring capacity of that possessed by the normal oils. The same exhibitor claims to have been the original inventor of spice extracts for the kitchen and household.

B. Langwisch, of Hamburg, Germany, under date of December 12th, 1876, sends another lengthy treatise on the decoration of the human features, which is somewhat similar in tenor to that of Violet, of Paris, from which extracts were made in the report of last year. It is quite evident that neither one of these gentlemen has as yet been thoroughly converted to the belief that "beauty unadorned is still the most adorned." The marvel is, that any one possessed of the general intelligence and information of our present correspondent should have so childlike and bland a faith in the credulity of your committee as to forward us four and a half closely written pages of foolscap for publication, all of them being the most unblushing puffs, asserting the superiority of his rice powder, theatre rouge, etc., over those made by the rest of mankind. Our friend makes a specialty of providing for the multitudinous wants of the stage; he has constantly on hand the exact tint of rouge, enamel, or whatever else may happen to be the correct thing for "the youthful lover; blooming manhood; venerable old age; the warrior, the seaman, the heavy man; the Moor, the Indian, the Greek, the mulatto, in fact, for all races of mankind. The first walking lady, the soubrette, and the old mother, are equally well provided for." He also manufactures quite a variety of shades of hair powders, enumerating white, light and dark gray, pale, light, medium, and dark blonde, as well as auburn, vulgarly styled red.

Justo Zabala Iñiguez, of Dalias, Province of Almena, Spain, has favored us with an exhaustive reply to our circular, replying systematically to the various questions proposed therein. The only article exhibited by this gentleman was a ferruginous syrup of cinchona. The decision in regard to its merits is modestly left to the judgment of the committee, the inventor having been actuated solely by a love of science and labor. The production of the syrup so far seems to have been quite moderate, though it appears to be highly esteemed by the local physicians. The syrup is prepared by selecting 30 grams of the bark of Cinchona condaminea, washing, drying, and grinding this; it is then macerated with 45 grams of alcohol for twenty-four hours; after this 120 grams of good sherry are added, and the maceration is continued for eight days. The liquid is now allowed to percolate off, and is replaced by 120 grams of sherry, which in its turn is left to macerate for sixteen days; this is then drained off, again displaced by 120 grams of the wine, and macerated for two days. The last portion is expelled by

distilled water. Refined sugar is then added to the mixed liquids to saturation, and after eight days the syrup is filtered through paper. One gram of soluble citrate of iron is now dissolved in 2 grams of distilled water, the solution is filtered and added to 120 grams of the syrup.

Bonifacius Monge Sanz, Doctor of Pharmacy, of Soria, Spain, advises us, under date of October 29th, 1876, that he exhibited preparations of digitalis and sarsaparilla, and epispastic paper (blistering tissue). Digitalis purpurea is found growing spontaneously in great profusion in the neighborhood of Rebollar, Estepilla, Valdeavellano, Zera, Espejo, etc. From an area of twenty square metres the exhibitor collected eighty kilograms of the herb in a short time. He obtained from this 33 per cent of aqueous extract, which was of good quality, yielding a transparent solution, entirely free from chlorophyll and carbonaceous matter. Digitalin, showing the characteristic tests, was likewise exhibited; also syrup of digitalis, made without heat, according to the directions of the Spanish Pharmacopœia; granules of digitalin, each containing one milligram, mixed with sugar of milk.

Flor, Carenou y Tur, of Zaragoza, Spain, in a letter dated September 29th, 1876, advert to the fact of their having exhibited a very superior quality of extract of liquorice. They express considerable dissatisfaction with the high import duty imposed on this article by the present tariff.

The following information about a product from another species of "Alstonia," is from the maker of Ditain, Gustav Grupe, Manila, Luzon, Philippines:

Ditain.

The bitter active (uncrystallizable) principle contained in the bark of "Echites scholaris" (Alstonia scholaris, Brown), Apocynaceæ. This species grows wild quite abundantly in the central provinces of the island of Luzon (chief of the Philippines), where it has long been known and esteemed by the natives (under the name of "Dita") as a most efficient tonic and febrifuge. These people using it from times immemorial in decoction against malignant, intermittent, and remittent fevers with the happiest result, the attention of our leading physicians was excited, and the active principle, ditaïn, has now become a staple article, and *ranks equal* in therapeutical efficiency with the best imported sulphate quinine. Numberless instances of

private and hospital practice, carried out by our best physicians, have demonstrated this fact. *Equal doses of ditaïn and of standard quinine sulphate have had the same medical effects;* besides leaving none of the disagreeable secondary symptoms, such as deafness, sleeplessness, and feverish excitement, which are the usual concomitants of large quinine doses, ditaïn attains its effects swiftly, surely, and infallibly.

(*a*) We use ditaïn generally internally, *i. e.*, in quantities of a half drachm (ʒss.) daily for infants, and double the dose for adults, due allowance being made, of course, for age, sex, temperament, etc., as thought convenient by the respective medical practitioner. Given internally, our standard (Manila) formula is:

For Infants.

℞. Ditaïn, ... ½ drachm.
Aq. flor. aurant., ... 5 ounces.
Syr. citri., ... 1 ounce.
M. D. S. One spoonful every hour.

For Adults.

Same mixture, but dissolving one drachm of ditaïn.

(*b*) Our medical gentlemen use ditaïn as injections in the rectum. In this form experience has suggested:

For Infants.

Ditaïn, ... 1 drachm.
Water, ... 1 pound troy.
Dissolve. For three injections, one every three hours.

For Adults.

Same preparation, only instead of one, use two drachms of ditaïn. Same intervals.

(*c*) We derive very beneficial effects from its use, too, under the form of poultices. Powdered dita bark, corn flour, each half a pound; hot water sufficient to make a paste. Spread on linen, and apply under the armpits, on the wrists and ankles, taking care to renew when nearly dry, and provided the desired effects should not have been obtained.

The extraction and preparation of ditaïn from the bark is analogous to the one of quinine. Maceration with acidulated water, and

precipitation, are its leading features. I have obtained from 100 parts of bark, 5 parts ditaïn, 0.85 parts sulphate of lime, and 10 parts extractive matter, the latter, however, of no medical virtue whatsoever.

As dita bark abounds in this country, and its manufacture is an inexpensive one, I hope to make its product acceptable and advantageous even in Europe. So far its cost of manufacture will enable me to lay it down in any part of the world at one-third the price of quinine sulphate, warranted invariably same strength and purity.

I beg now to present the following particulars as to the pharmacological characters, chemistry, etc., of the bark:

The tree grows to a height of fifty feet or more, and can be peeled with impunity. The active principle therefrom obtained is a dark-green powder, very hygroscopic, easily soluble in water, but not in absolute alcohol or ether. From the researches of Gorup Besanez, it appears to contain a crystallizable substance, the alkaloid.

"The pieces of bark, as circulating in trade, are 0.04–0.06 met. long (0.025 metre = 1 inch Engl.), 0.015 m. broad, and 0.001–0.004 thick. They are bent irregularly, present on the exterior a thin leather-brown layer (kind of cork), and a good many longitudinal and transversal fissures, which make the bark look scaly. Very often the edges of the fissures are raised with the corky layer, and the transversal cracks themselves filled, whole or partially, with a colorless cellular tissue.

"The bark is of moderate hardness, and breaks easily, young bark giving fibrous, and old granular fragments.

"The interior of the bark is slightly indented, and presents the appearance of depressed meshes, sometimes longitudinally fibrous. The color from leather-brown to dark gray, dotted very frequently with black specks and points. Lichen is quite seldom on it. When ground, the bark furnishes a yellow-gray powder, which is inodorous. In chewing, it communicates only gradually to the palate a slightly bitter, but not disagreeable taste. The cellular tissue of the bark shows, under the microscope, crystalline deposits (oxalate of lime).

"The aqueous extract is dark yellow, clear on cooling, pleasantly bitter, and suffers no alteration with ferruginous salts. Though sugar of lead throws down a precipitate from the decoction, there is another one formed in the filtered liquid through the addition of basic acetate of lead. This latter precipitate is copious and amorphous. After filtering and eliminating all the lead, the active bit-

ter principle of the bark can be thrown down with phospho-wolframic acid from the neutral solution.

"Ether, chloroform, and petroleum essence only withdraw from the bark indifferent extractive matter; boiling alcohol is the most efficient solvent. Potassic lye colors the bark yellow. Diluted muriatic acid, especially when heated, dissolves large amounts of oxalate of lime.

"Dried at 100° Cels., the bark loses 12.7 per cent. moisture, and incinerated, leaves 10.4 per cent. of a white ash, chiefly lime.

"Treating the precipitate obtained by phospho-wolframic acid with aq. barytæ in excess, with ether and acetic acid, the analysts obtained an alkaloid which they called 'ditamin,' and which amounted to about 0.02 per cent. of the bark employed. It is a white amorphous powder, slightly bitter, easily soluble in ether, chloroform, benzin, and alcohol. From petroleum essence, in which it seems to be less soluble, it may be obtained crystallized. Concentrated sulphuric acid dissolves it, cold, with reddish color, warm, with violet. In concentrated nitric acid it is soluble, turning the solution yellow; and on heating same, the liquid first grows dark-green, afterwards orange, evolving red vapors. Heated in a capillary tube, it melts, forming at 75° a light yellowish, and at 130° a deep brownish-red liquid. Its alcoholic solution is alkaline, and capable of neutralizing strong acids, thereby forming salts remarkable for their extreme bitterness. Its chlorhydrate leaves, on evaporation, a residue which, though amorphous, indicates some tendency to crystallization. Only once, under circumstances unknown to the operator, it formed nice colorless needles, which were easily soluble in alcohol and water. This last (aqueous) solution presented the following reactions: with

"Chloride of platinum, $PlCl_3$, yellow amorphous precipitate, somewhat soluble on heating.

"Chloride of gold, Au_2Cl_3, dirty-yellowish amorphous gelatinous precipitate, easily melting to a brown oily liquid.

"Bichloride of mercury, HgCl, white amorphous precipitate, soluble on heating in the supernatant liquid, and depositing, on cooling, in small watery groups.

"Double iodide of mercury and potassium, HgIKI, white amorphous precipitate, very little soluble in cold, but easily in hot water.

"Perchloride of iron, Fe_2Cl_3, no alteration.

"Iodide of potassium, KI, from concentrated solutions, produces an amorphous precipitate, easily soluble in water, and barely so in solution of iodide of potassium.

"Rhodanide of potassium, KCyS, from concentrated solutions, a white amorphous turbidity, which disappears on further dilution.

"Tannin, a white gelatinous precipitate.

"Phospho-wolframic acid, abundant white precipitate.

"The ultimate organic analysis could not be undertaken, owing to lack of material.

"If the bark be digested with essence of petroleum, there results a resinous body, which, after having been purified, is but sparingly soluble in boiling alcohol, but easily so in chloroform, ether, essence of petroleum and benzin. The analysts call this body 'echicaoutchin.' It is not acted upon by a potassic lye; if heated, it melts first, and then burns off easily and completely. Under tepid water it may be drawn out to long silky fibres. The water being more than lukewarm, the substance loses its elasticity, but recovers it again at a lower temperature. The results of the ultimate analysis correspond with the formula, $C_{25}H_{40}O_2$.

"If the concentrated extract of the bark obtained with essence of petroleum (see above) be boiled with alcohol, there separates an oily liquid, which soon solidifies, and superincumbent there forms a copious layer of white crystals, which the analysts found to contain two new substances, viz., echicerin and echitin. Treating the former with sodium, they obtained its acid, analogous in composition, which they called echicerinic acid. Echitin is a neutral body, and crystallizes in tender white scales. Evaporating the alcoholic solution left over from echicerin and echitin, another neutral body, echiteïn, crystallizes out; bromine converts it in tribromechiteïn; and lastly the alcoholic mother liquors give a resinous substance called echiretin. Along with ditamin the analysts discovered another body, equally to be precipitated by phospho-wolframic acid, equally bitter, but offering in some respects only the essential qualities inherent to an alkaloid, or vegetable basis. A fuller investigation of this body could not be effected, through lack of material. The amount of all the resinous and oleo-resinous bodies, echicaoutchin, echicerin, $C_{30}H_{48}O_2$, echitin, $C_{32}H_{58}O_2$, echiteïn, $C_{42}H_{70}O_2$, and echiretin, $C_{35}H_{56}O_2$, along with another undetermined resin, is, all told, 2.95 per cent. of the bark.

"Echiretin offers a great deal of similarity with a resin extracted

by Heintz from the juice of the cow-tree, and of another tree growing wild in the Guianas—Tabernamontana utilis. In composition, but not in its properties, it is identical with lactucarin. The analysts are of opinion that it is isomerous with said body, as well as with camphor obtained from cubebs.

"It would appear that ditamin was also the body which Mr. de Gorup-Besanez obtained from ditaïn, but which he could not investigate further, owing to lack of material. This much, however, seems to be certain, that the dita bark does not contain notable quantities of an alkaloid, properly so called, and that the febrifuge properties of the bark, as well as of the extract, can hardly be attributed to the very limited amount of alkaloid contained therein.

"In conclusion, we would say, that the results arrived at by ditaïn, in our Manila hospitals and private practice, are simply marvellous. An octogenarian mestizo, suffering from typhoid fever, was cured by the application of 6 grams. A Spanish officer, subject for a long time back to persistent attacks of malarious fever, was treated six times a day with clysmas (injections in the rectum), each of 0.2 gram ditaïn; in three days he was well. Its tonic effects are unrivalled. In our military, hospital, and penitentiary practice, ditaïn has perfectly superseded quinine, and it is now being employed, with most satisfactory results, in the island of Mindanao, where malignant fevers are prevalent."

Extr. Antidysenteric. Aquos.

Is prepared from the peeled fruit of Garcinia mangostana, a species growing abundantly in Madras, Cochin China, and in the south of the Philippine Islands. The decoction has long been used and is deservedly esteemed among the natives; but, in order to raise the efficiency of the drug, and to insure its conservation, I have prepared the extract, which, I am happy to say, has met with the most flattering reception, both here and abroad. In chronic diarrhœa, in chronic affections of the uterus, of the bladder, and of the urethra, it has proved most efficient; and in dysentery, even when inveterate, it stands unrivalled. Cases where neither opium, ipecacuanha, calomel, nor astringents were of avail, have been rapidly cured by this marvellous therapeutical agent. So with my oldest son (now deceased), whose ailing, dysentery, not yielding to any of the abovementioned drugs, was attacked by a mixture

of 8 grams extr. antidysent. in 120 grams sweetened water and 2 drops of laudanum. After using same for twenty-four hours, the dejections of blood and mucus ceased, the fever diminished, and in two days the patient was recovering. Since then the consumption of extr. antidysent. rapidly increased, and now its sale, both here and abroad, is quite an extensive one. We use it here as mixture for infants: Extr., 10–20 centigrams; sweetened water, 30 grams; for adults, double and over. It may very well be given in pills. For injections in the rectum: Extract, 16 grams; water, 250 grams; laudanum, 0.5 gram. Dissolve and use for eight injections.

The cost of manufacture being moderate, we will be enabled to lay it down (the extract) in the United States at $4 per kilogram, warranted equal strength and purity always.

Bals. Tagulaoay (Indian Word, Signifies Blood-healing).

This is a solution, in cocoanut oil, of a resinous principle, contained in the roots of different vines not yet botanically classified, and which grow in the south of the Philippine Islands, especially on the Island of Cebu. All imitations will be distinguished from mine by not presenting a viscous glutinous appearance (drawing out to long threads between the fingers), but by being merely a thin oily liquid. The balsam tagulaoay may be used both externally and internally. Externally applied, it stops almost immediately the bleeding of wounds caused by cutting or stabbing; ditto, bruises and hæmorrhages. It leaves no scars, and causes no irritation or inflammation whatever; on the contrary, reduces such as may exist. A few drops are applied on the wound, lint spread over it, and the whole bandaged. We have derived, moreover, simply wonderful effects from the balsam used internally. Against bronchial and pulmonary affections, especially consumption, it is a panacea. A monk here resident, Rev. Padre Norberto, convento de P. P. Dominicanos, Manila (who cheerfully will give all information), was saved from imminent death through consumption by this agent, his health having been already despaired of by the physicians. Similar cases of an equally desperate character have occurred, both here and abroad. The active resinous principle contained in the root can only be extracted when fresh, and then only by essence of turpentine or sweet oil. An extract can be prepared, of course,

by distilling off the turpentine, and the pure principle thus obtained may be shipped.

Given internally, our Manila medical men prescribe it either dissolved in syrup or in oil of sweet almonds (from one-half to one spoonful three times a day, according to circumstances). Equally well it may be given in pills.

GUSTAV GRUPE,
Honorary Member of the Lubecker
Naturwiessensch. Verein,
Member of the Sociedad economica de
Amigos del Pais en Manila.

Giuseppe Sbertoli advises us from Genoa, Italy, that he exhibited carbonate of lead, giving some statistics of its manufacture and exportation.

Giovanni Giuffrida Leotta, of Catania, Italy, writes, under date of Dec. 18th, 1876, that he exhibited oil of sweet almonds. He expresses this on a large scale by means of hydraulic presses. He states that at present the manufacturers' price is about 4.40 *lire* per kilogr., being about 40 cents, gold, per pound. He claims that all oil of sweet almonds which is sold at a lower rate must be mingled with other substances. For our special information, he adds that the oil of sweet almonds is a refreshing medicine, and an emollient for the intestines.

Raffaello Gianelli, of Sienna, Italy, writing on Dec. 3d, 1876, states that he exhibited honey, chocolate, and cinnabar. Light-colored and light-yellow honey is produced on a very extensive scale in the provinces of Sienna and Grosseto (Tuscany), in the months of October and November.

Antonio Maria Mendes Gragera, of Portugal, sends the following information about apiol, which he manufactures:

APIOL.

It is well known that Peyrilhe, Haller, and others have recommended Apium graveolens and Apium palustre as antipyretic. Besides these learned gentlemen, others have advised the use of Apium petroselinum, the juice of the leaves and the decoction, etc., for the cure of intermittent fevers. Finally Doctors Jeret and Homolle gave the preference to the fruit (miscalled the seeds) of

this vegetable, and after having used this for a long time exclusively, they made some chemical experiments upon it, the result of these researches being the extraction of an immediate principle, which they recognized as the active principle of the common parsley, and which they named apiol. Apiol has been for a long time exclusively employed for fevers, and has taken the place of quinine and its compounds.

After the repetition of this several times, it attracted the notice of some physicians, and the inventors of apiol turned this discovery to some use. The result obtained has been so satisfactory that Drs. Jeret and Homolle, and also those doctors who have used the apiol as an emmenagogue, consider it among the most active.

Now the use of apiol is limited almost exclusively to amenorrhœa and to dysmenorrhœa, because whilst it exerts an action against severe forms of fevers, the results obtained have not been the same as those of quinine and its compounds.

In order not to make this note very long, we will specify only the medicinal and chemical properties of apiol. Apiol is obtained by treating the grain of parsley, pulverized with alcohol, at 70° to 80° C. (158°–176° F.). Sufficient pulverized fruit is introduced into the displacer. When it is sufficiently exhausted the liquor is decolorized by filtration through washed animal charcoal, then distilled in a bath to draw off about three-fourths of alcohol. The residue is taken up by ether or chloroform, when they are separated again by a second distillation. They put it on a stove and evaporate until the last trace of the menstruum (?) has disappeared; at last they mix it by trituration with an eighth of its weight of litharge, and leave it for forty-eight hours, after which it is filtered through a light bed of charcoal, and then apiol settles perfectly pure and colorless.

Our process is identically the same for separating apiol from other substances.

These substances are principally pectin or vegetable gelatin, susceptible of furnishing pectic acid and some *pectate* under the influence of alcohol, perhaps the apeina of Brocamont and the butter of parsley, a solid substance, crystallizable by ordinary heat, and which can be melted at 25° Centigrade.

The French inventors use ether or chloroform, while we use warm water (30 or 40 per cent.), because it dissolves these substances

and leaves the apiol. After several washings with warm water, we separate it entirely from the water by a filter, leave it some hours, then opening it, the apiol escapes, while the water remains. The apiol still retains a greenish hue, even after filtration through charcoal. Drs. J. and H. use lead water for discoloring it, but we believe the color is due to chlorophyll; as this cannot affect the medicine we prefer to leave it as it is.

It is six years since our Persil has been used in Portugal, the result being favorable.

Our Persil comes from the country near Lisbon.

JOSEPH P. REMINGTON,
Chairman of Committee.

REPORT OF THE COMMITTEE ON EXHIBITION AT TORONTO.*

THE exhibition in connection with the Twenty-fifth Annual Meeting of the American Pharmaceutical Association was held in Temperance Hall, Toronto, well suited for such a purpose, though a little out of the way of members attending the business meetings.

The first exhibition of the kind held outside the boundaries of the United States had naturally many difficulties to contend with, and beside the actual ones the prospect of such limited, undoubtedly, the variety and extent of the exhibit.

The absence, with two exceptions, of Canadian exhibitors from the field was noticeable, to the disappointment of many who looked forward to something new in character.

Delay in transportation prevented Messrs. Charles T. White & Co. from making a display of their chemical productions.

DRUGS.

Messrs. B. O. & G. C. Wilson, Boston, show sixty-four samples of indigenous and foreign herbs (with two exceptions the growth of 1876) of the finest aroma and color, with some pressed packages equally choice. If all their stock is dried, selected, and preserved with the same care, it should commend itself to the trade.

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* Read at the Sixth Session.

Messrs. Powers & Weightman, Philadelphia, display six samples of cinchona.

Messrs. McKesson & Robbins, New York, have twenty-one samples, including some of the later additions to Materia Medica, eucalyptus, damiana, coca, etc.

CHEMICALS AND PHARMACEUTICAL PRODUCTS.

Messrs. Powers & Weightman, Philadelphia, make their usual elaborate and elegant display with even greater profusion than hitherto. An enumeration of the products of this well-known establishment scarcely does justice to the collection, which embraces thirteen salts of the cinchona alkaloids, in massive quantities; in opium products, morphia salts, narcotin, meconin, and bimeconate of morphia; sulphocarbolates of zinc, ammonia, soda, and potassa; iron scale preparations, mercurials, and pharmacopœial compounds in great variety. The whole exhibit, being the largest ever seen at Toronto, received considerable notice from the pharmacists of that section.

Messrs. McKesson & Robbins, New York, show fifty small specimens of rare chemicals, seven bottles of essential oils, of fine appearance, ten fluid and five solid extracts, of the newer kind, a fine display of gelatin-coated pills, and perfume extracts of good quality.

Messrs William R. Warner & Co., Philadelphia, exhibit an extensive assortment of sugar-coated pills and fluid extracts.

Messrs. Seabury & Johnson, New York, have a collection of their well-known so-called rubber plasters, court plasters, isinglass, and adhesive plasters, tastefully arranged.

Messrs. J. C. Allan & Co., Buffalo, soluble bougies, variously medicated.

Messrs. W. H. Schieffelin & Co., New York, present sixty-seven varieties of transparent-coated pills, which they claim to be perfectly soluble.

Mr. William Saunders, London, Ontario, shows a variety of one hundred fluid extracts of reliable appearance.

Mr. E. Scheffer, Louisville, Ky., has sample bottles of his saccharated pepsin.

Mr. F. Alf. Reichardt, New York, shows tasteless tannate of quinia and lozenges of the same, nitrite amyl pearls, iodoform crayons, and fluid extract of damiana.

Messrs. Lazell, Marsh & Gardiner, New York, exhibit twenty

fluid extracts, including all those of recent introduction; twenty powdered extracts; podophyllin and leptandrin of superior quality; saccharated pepsin and pancreatin, with a variety of twenty perfumes, fully appreciated by visitors.

Messrs. John Wyeth & Bro., Philadelphia, show their compressed pills in large variety.

Last and not least in this class of exhibits is that of Mr. Bullock, Philadelphia, who makes a very interesting display of the analytical products of three pounds of veratrum viride root, viz., jervia pure, in crystal, nitrate of jervia, two resins, and a fatty oil.

PHARMACEUTICAL APPLIANCES.

The display in this department is confined to the following:

Mr. Henry Troemner, Philadelphia, who shows a beautiful pair of dispensing scales, with agate bearings, silver beam, gold plates, upright stem, and nickel-plated pans, sensitive to $\frac{1}{100}$ grain, four other dispensing scales and an assortment of counter scales, all of fine construction and extremely sensitive.

Messrs. Neidlinger & Co., New York, send a wafer-press and wafers for cachets.

Messrs. Von Buest & Co., New Albany, Ind., have a soap-cutting machine.

MISCELLANEOUS.

F. A. Howell, Jr., of New York, exhibits a show-case fitted with a door, which, by a contrivance, slides under the case on being opened.

Dr. Frederick Hoffmann, of New York, exhibits three microscopes, manufactured by Hager & Mersten, of Berlin.

Mr. W. Millichamp, Toronto, shows three nickel-plated show-cases with bent-glass fronts.

Messrs. H. K. & F. B. Thurber, New York, send samples of Dr. Underhill's native wine, two varieties, sweet and dry port.

Messrs. Mellor & Rittenhouse, Philadelphia, liquorice, in sticks and lozenges.

Messrs. Gates Bros., Saratoga, N. Y., have a collection of the Saratoga mineral waters in ten varieties.

Respectfully submitted,

HENRY J. ROSE,
G. F. H. MARKOE,
ALB. E. EBERT,
CHARLES RICE,
T. R. BAKER.

REPORT OF THE COMMITTEE ON LEGISLATION.*

At the last meeting of the Association, Mr. Diehl stated that in 1876 the pharmacy law of Kentucky had been amended, and communicated the essential features contained in the new act. This has since been received, and on examining it the committee find it to be essentially the old law, but embracing the following modifications:

(1.) Persons who, after the passage of the act, have had at least three years' experience in the dispensing and retail drug business are admitted to examination to prove their competency for conducting said business.

(2.) Persons applying for registration as assistants in pharmacy must, in addition to the other requirements, also prove their sober habits and good moral character.

(3.) All registration fees are $10, and annual registration is not required.

(4.) Any person may own a store, but registered pharmacists only are permitted to conduct the business.

(5.) Persons who are not registered pharmacists are prohibited from making use of that title under any circumstances.

(6.) Practitioners of medicine are exempt from the provisions of the law. This we consider the most objectionable clause of the amended law, and it is hardly necessary now to again prove that graduates in medicine, unless they have had sufficient practical experience in the pharmaceutical business, are not properly qualified to carry on said business.

(7.) The exemption in the original law of makers and dealers of proprietary medicines not having been re-enacted, the retailing of such medicines is prohibited, except by those legally entitled to carry on the dispensing and drug business.

The State Board of Pharmacy under the new law, a copy of which is annexed, consists of John J. Frost, of Lexington, President; Vincent Davis, of Louisville, Secretary and Registrar; Emil Scheffer, C. Lewis Diehl, and John Colgan, of Louisville; H. M. Gilson, of Paducah, and W. H. Averill, of Frankfort.

Early in the present year a pharmacy law was passed in the State of Maine. It applies to the whole State. The governor is

* Read at the Second Session.

the appointing power, the commissioners of pharmacy must be three *suitable persons*, and it is to be hoped that competent pharmacists only will be considered suitable hereafter, as they have been for the first board. Applicants for registration must present satisfactory evidence of having been employed at least three years in an apothecary store, or of having graduated from a regularly established medical or pharmaceutical school, before they will be admitted to examination. It will be observed that all who intend to engage in the apothecary's business are subjected to an examination; as far as this provision applies to graduates in medicine, it is eminently just, and the experience of the Maine Commissioners of Pharmacy agrees with that of other pharmaceutical boards, that, as a rule, the least satisfactory examinations are made by medical graduates having had no pharmaceutical experience. Pharmacists in business at the time of the passage of the act are not affected by the law, and it is left optional with them, if they desire to become registered, to submit to an examination or not. We have been informed that they have generally availed themselves of this provision, and that the total number of registrations in the beginning of August has been 188. Section 5 of the law very curiously limits the medicines and poisons which registered apothecaries have the right to keep to those authorized by the Dispensatory and Pharmacopœia, and it exempts them from the search and seizure process of the prohibitory law, inasmuch as it forbids the *sale* of intoxicating liquors only; under the arbitrary Maine liquor law apothecaries had no legal right even to *keep* such for the purpose of compounding medicines. The Commissioners of Pharmacy are N. S. Harlow, of Bangor; Charles K. Partridge, of Augusta; and H. T. Cummings, of Portland. Though it is not all that the pharmacists of Maine may have desired, yet the law is a good one as far as it goes, and through the care of the Maine Pharmaceutical Association will doubtless be improved if opportunity offers.

The efforts of the New Jersey pharmacists, which have been persistently continued for a number of years, have at last been successful, in so far as the passage and approval of a law has been secured. The bill, which was brief and concise, was prepared by Mr. H. P. Reynolds, President of the New Jersey Pharmaceutical Association, and passed the lower house without modification, but was saved from total defeat only through the exertions of Hon. James J. Bergen, who, however, could not prevent its mutilation by the dropping of several passages and the insertion of others, with

the evident intention of throwing as many obstacles as possible into its way. The chief bungling amendments, for which the Senate is responsible, are contained at the end of the sixth section after the word "provided," and the last two-thirds of the seventh section following the words "collected under the provisions of this act."

The Board of Pharmacy consists of five members, appointed by the governor from fifteen pharmacists, nominated by the New Jersey Pharmaceutical Association. Every pharmacist in business at the passage of the act is required to be registered on the payment of $2; all others, except graduates in medicine and pharmacy, must successfully pass an examination before they become entitled to registration, the fee being $5. The law creates the title of "registered pharmacist," the unlawful use of which is punished with a fine of $50. Since the law grants a controlling influence for its execution to the New Jersey Pharmaceutical Association, it may be reasonably expected that more enlightened legislators, than those of the last Senate of New Jersey, will listen to the counsel of that Association when it becomes desirable to perfect the present law. The first Board of Pharmacy has been constituted as follows: James R. Mercein, Jersey City; William R. Laird, Jersey City; Charles Holzhauer, Newark; Emmor H. Lee, Camden; and R. W. Vandervort, Newark.

A pharmacy act has been passed for the Province of Nova Scotia in 1876. It incorporates the Nova Scotia Pharmaceutical Society, and provides for the registration, previous to December 31st, 1877, of all persons actively engaged in or having served at least seven years at the drug and apothecary business previous to the passage of the act; all others must submit to an examination before a board appointed partly by the Provincial Government and partly by the Pharmaceutical Council, which consists of twelve members. The examiners are H. L. Atkins, A. P. Reid, M.D., W. H. Simson, W H. Waddell, and John W. Webb.

The above are all the laws of which the committee has any knowledge and which have not been previously reported; copies of the four acts are attached to this report. The committee would request the various pharmaceutical examining boards to regularly furnish to the chairman copies of official reports, and notify him of such occurrences as may have a bearing upon pharmaceutical legislation or the enforcement of the pharmacy laws.

All of which is respectfully submitted.

JOHN M. MAISCH,
Chairman of Committee on Legislation.

PHARMACY LAW OF KENTUCKY.

Chapter 845.

AN ACT *to amend an Act entitled An Act to regulate the sale of Medicines and Poisons, approved February the twenty-first, eighteen hundred and seventy-four.*

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

SECTION 1. It shall be unlawful for any person, unless a registered pharmacist or registered assistant pharmacist in the employ of a registered pharmacist, or unless acting as an aid under the immediate supervision of a registered pharmacist, or a registered assistant pharmacist within the meaning of this act, to retail, compound, or dispense medicines or poisons, *except* as hereafter provided.

SEC. 2. Any person in order to be a registered pharmacist, or a registered assistant pharmacist, in the meaning of this act, shall be either a graduate in pharmacy, a practicing pharmacist, or a practicing assistant in pharmacy. Graduates in pharmacy shall be such as have obtained a diploma from a regularly incorporated college of pharmacy. Practicing pharmacists shall be such persons as at or prior to the passage of this act, have kept and continue to keep open shops for compounding and dispensing the prescriptions of medical practitioners, and for the retailing of drugs and medicines, and who shall have declared their intention, in writing, of keeping open shop for the compounding of prescriptions of medical practitioners, and the retailing of drugs and medicines, and such other persons, who, after the passage of this act, shall have declared their intention, in writing, to open a shop for compounding and dispensing the prescriptions of medical practitioners, and for retailing drugs and medicines, shall have at least three years of practical experience in the business, and shall have passed a satisfactory examination before the State Board of Pharmacy.

Practicing assistants in pharmacy shall be such persons as shall have served five years immediately preceding the passage of this act, in a shop or shops where the prescriptions of medical practitioners are compounded, and such other persons as have served three years' apprenticeship in a shop or shops where the prescriptions of medical practitioners are compounded, have furnished a certificate of sober habits and good moral character from the county judge of the county in which he resides, and shall have passed a satisfactory examination before the State Board of Pharmacy.

SEC. 3. The State Board of Pharmacy shall consist of seven persons, and immediately after the passage of this act, the governor shall appoint, from among the most skilful pharmacists of the State, the first Board of Pharmacy, and on the first Monday in July of every third year thereafter, the governor shall appoint the State Board of Pharmacy from the registered pharmacists of the State, the Louisville College of Pharmacy to recommend to the governor ten persons, members of said college of pharmacy, four of whom shall

be appointed on the State Board of Pharmacy. All vacancies by death, resignation, or removal from the State, shall be filled by the board from the registered pharmacists of the State.

SEC. 4. Four members of said board shall constitute a quorum. Said board shall organize by the election of a president and secretary, both of whom shall sign all certificates and all other official documents. Said board shall meet twice a year, on the second Thursday in January and second Thursday of July, and shall have power to make by-laws, and all necessary regulations for the proper fulfilment of their duties under this act. The secretary of said board shall also be registrar of pharmacists. The duties of said board shall be to examine all applicants for registration, to direct the registration by the registrar of all persons properly qualified or entitled thereto, and report to each regular session of the General Assembly, on the condition of pharmacy, together with the names of all registered pharmacists and assistant pharmacists.

SEC. 5. The duties of the registrar of pharmacists shall be to keep a book, in which shall be entered, under the supervision of the State Board of Pharmacy, the name and place of business of every person who shall apply for registration. It shall also be the duty of the registrar, to duly note the fact against the name of any registered pharmacist or assistant pharmacist who may have died or removed from the State, or disposed of, or relinquished his business, and to make all necessary alterations in the location of persons registered under this act.

SEC. 6. Every person applying for registration under this act, shall pay to the State Board of Pharmacy ten dollars, and if qualified, shall be furnished, free of expense, with a certificate of registration. Any registered assistant pharmacist may, with the consent of said board, be entitled to registration as a registered pharmacist, and shall be furnished with a certificate of registration, for which certificate he shall pay the registrar one dollar.

SEC. 7. Any person may own and keep an open shop for compounding and dispensing the prescriptions of medical practitioners, and for the retailing of drugs and medicines, but such business shall actually be conducted by a registered practicing pharmacist.

SEC. 8. Any person not a registered pharmacist, who shall, after the passage of this act, take, use, or exhibit the title of registered pharmacist, or any person who shall violate any of the provisions of this act, shall upon the first conviction be sentenced to pay a fine of fifty dollars, and upon the second and every subsequent conviction, shall be sentenced to pay a fine of one hundred dollars.

SEC. 9. The fees received for examination, registration, and certificates, and all fines under this act, shall be appropriated to defray the expenses of the State Board of Pharmacy.

SEC. 10. This act shall not apply to any town or city of less than five thousand inhabitants.

SEC. 11. Nothing in this act shall be construed to apply to any practitioner of medicine.

SEC. 12. This act to take effect on and after July the fifteenth, eighteen hundred and seventy-six.

W. J. STONE,
Speaker of the House of Representatives.
JNO. C. UNDERWOOD,
Speaker of the Senate.

APPROVED March 18th, 1876.
JAMES B. MCCREARY.

By the Governor,
J. STODDARD JOHNSTON,
Secretary of State.

COMMONWEALTH OF KENTUCKY,
OFFICE OF THE SECRETARY OF STATE.

I, J. Stoddard Johnston, Secretary of State, certify that the foregoing is a true and perfect copy of an act of the General Assembly of the Commonwealth of Kentucky, passed at its December session, 1875, entitled An Act to amend an Act, entitled "An Act to Regulate the sale of Medicines and Poisons," approved February 21st, 1874, as appears from the original enrolled bill on file in my office.

In testimony whereof, I have hereunto set my hand, and affixed the [L.S.] seal of my office, this twenty-second day of March, A.D. eighteen hundred and seventy-six, and in the eighty-fourth year of the Commonwealth.

J. STODDARD JOHNSTON,
Secretary of State.
By THOS. S. BROUSTON,
Assistant Secretary.

PHARMACY LAW OF MAINE.

AN ACT *to prevent incompetent persons from conducting the business of apothecaries.*

Be it enacted by the Senate and House of Representatives in legislature assembled, as follows:

SECTION 1. The governor, with the advice of the council, shall appoint three suitable persons to be commissioners of pharmacy, one of whom shall hold his office for one year, one for two years, and the other for three years, and each until his successor shall be appointed and qualified; and each year thereafter another commissioner shall be so appointed for three years and until a successor be appointed and qualified. If a vacancy occur in said commission another shall be appointed as aforesaid to fill the unexpired term thereof. Before entering upon the duties of their office, the commissioners shall be sworn to faithfully and impartially discharge the same, and a record thereof shall be made on their commissions.

SEC. 2. Said commissioners shall examine any person who hereafter desires

to engage in the business of an apothecary, and if found skilled in pharmacy, shall give him a certificate of that fact, and that he is authorized to engage in the business of an apothecary, and such certificate must be signed by at least two commissioners. They shall register in a suitable book, to be kept in the secretary of state's office, the names and places of residence of all persons to whom they issue certificates, and the dates thereof, and for each certificate of registration given under the provisions of this act, said commissioners shall be entitled to receive from the applicant five dollars, which shall be in full for all services and expenses.

SEC. 3. Every person hereafter entering upon the business of an apothecary shall first be examined by said commissioners, and present to them satisfactory evidence that he has been an apprentice or employed in an apothecary store where physicians' prescriptions are compounded, at least three years, or has graduated from some regularly established medical school, or college of pharmacy, and is competent for the business, and the commissioners may then grant him a certificate and registry as hereinbefore provided.

SEC. 4. Any person engaged in the business of apothecary at the passage of this act may receive a certificate and be registered as aforesaid, on application to said commissioners, and presenting to them satisfactory evidence of his competency therefor.

SEC. 5. Apothecaries registered as herein provided, shall have the right to keep, under such restrictions as the legislature may impose, all medicines and poisons authorized by the United States Dispensatory and Pharmacopœia as of recognized medicinal utility; provided, that nothing herein contained shall be construed as to authorize the sale of intoxicating liquors.

SEC. 6. If any person shall hereafter engage in the business of an apothecary, who is not now in business, contrary to the provisions of this act, he shall be subject to a penalty of fifty dollars for each week he shall so continue in such business, to be recovered by an action of debt for the use of any person suing therefor, or by indictment for the use of the county.

SEC. 7. This act shall not apply to physicians putting up their own prescriptions, or to the sale of proprietary medicines.

Approved February 9th, 1877.

The law of the State of Maine prohibiting the sale of alcoholic liquors appears to have created serious inconveniences in procuring liquors for medicinal purposes, since under the law it is impossible to obtain them except through the various town agencies. As long as fermented liquors are medicinally employed, the apothecary would seem to be their proper custodian *for medicinal purposes*, and it is difficult to imagine why the physician should be limited in his selection to those articles kept by the agencies, and why the apothecary should not be permitted to purchase what may be needed in his business transactions where he can obtain it of good quality. There is undoubtedly a possibility that an unscru-

pulous person might endeavor to push such sales beyond the requirements of strictly medicinal use; but there seems to be no danger of such an occurrence from the Maine Pharmaceutical Association, by whose order, in August last, a committee has drawn up the following circular, which explains the position of the pharmacists in that State:

All those who deal in drugs, or who manufacture and sell medicines in the State of Maine, are aware of the great disadvantages and unjust restrictions under which the apothecary in this State is obliged to conduct his business.

That our laws in this respect should be so amended as to discriminate between those who desire merely to carry on a legitimate traffic in medicines, and others who are willing to keep barrooms, and to furnish spirits for improper uses, seems evident enough to all who have had opportunities of studying the working of these laws in relation to the druggists and apothecaries of the State.

We have been compelled for about twenty years to stand in the position of violators of law. There is probably not one of us who has been able to conduct his business during all these years without breaking the laws. We are invited and sometimes urged to do so, daily, and almost hourly, by our most respectable and temperate citizens, and by the strongest supporters of prohibition; and so strong is their feeling in favor of buying all their medicines of men trained and educated in the business, that they assist in this violation of a special law with the utmost serenity and cheerfulness.

Now, it does not seem too much to ask that the laws should be so modified as to recognize the fact that men who have spent their lives in studying the art of dealing in powerful and poisonous articles, and a great part of whose education has served to teach them how to discriminate between the customers to whom it is or is not proper to sell such preparations, are on the whole likely to be careful dispensers of alcoholic liquors for medicinal purposes.

It is not unreasonable to ask that those who are trusted to deal out prussic acid, strychnine, laudanum, and all other poisons, without let or hindrance from the laws, should also be allowed to keep and to sell for proper uses the wines and spirits needed in the practice of medicine and pharmacy.

At present, by the law, we are all classed with the keepers of the worst dens in the State. The sale of a single ounce of brandy, to save a dying child, renders us liable to the penalties incurred by him who plies his drunken victim with poisonous drinks till delirium tremens destroys his power to purchase more.

Under our laws judges and juries are allowed no discretion, and the stock and property of the apothecary whose sales of liquors are strictly limited to those needing them as medicine, are liable to seizure and destruction equally with those of the worst barkeepers in our cities.

The establishment of town agencies does not supply the place of the careful apothecary, who has learned how to buy good liquors, and to whom to sell them. In many towns no agents are appointed; in few towns are the agents qualified to judge of the quality of their stock. In some places the agency is kept open only a portion of the day, so that those needing the medicine ever

so urgently, cannot obtain it when it is most wanted. In all towns the goods must be bought of the State agent at a heavy advance on actual cost, and the local agent loses the advantage of buying at first hands the goods best adapted to his trade.

There are many aspects of moral and legal view in which this subject can be considered, but they all point to the apothecary as the proper custodian and dispenser of alcoholic medicines. If it is not wrong for a community to sell spirit through an agent, certainly, from a moral standpoint, it is not the crime which the statute makes it for an apothecary to dispense it when required by the invalid. On the other hand, if wrong for the apothecary to dispense it under such circumstances, it is a crime for a community to authorize an agent to do so, in which every citizen shares the guilt and moral stigma.

If, by law, the sales of one man in a city can be restrained within due limits, it cannot be very difficult to so word it that it may regulate the business of several men.

The pharmacy act passed last winter, under which apothecaries are registered, affords the means of knowing who are really apothecaries, and who have assumed the title as a cover to a trade in contraband goods. A very slight change in the wording of the law would enable the registered apothecary to conduct a legitimate business, as demanded by the public, in all medicines as needed by our physicians and invalids.

Let us, then, during the coming winter, ask our lawmakers to remove this stigma from our profession,—to recognize our claim to justice,—to acknowledge in the law that which the majority of our townsmen admit and assert in private talk,—our right to deal in all medicines needed by our customers. Let us ask for the right to buy our goods where we please; of getting them freighted to us without hindrance from officers of counties or towns through which they have to pass, and for the right to dispense them properly, according to our own best judgment, after we have received them. Let us make concerted effort to get petitions signed by as many as possible of our good citizens, asking for these measures of justice, and let us do our best to make sure that good men, fair-minded men, men who are not blinded by ignorance, prejudice, or ambition, are elected to represent us at Augusta next winter.

PHARMACY LAW OF NEW JERSEY.

Chapter CXXXIII.

An Act *to regulate the practice of pharmacy.*

1. Be it enacted by the Senate and General Assembly of the State of New Jersey, that from and after the first day of January, one thousand eight hundred and seventy-eight, it shall be unlawful for any person or persons to open or conduct any pharmacy or store for retailing, dispensing, or compounding drugs or medicines, unless such person shall be or shall employ and place in charge of such pharmacy or store, a registered pharmacist, within the meaning of this act; and every pharmacy or store kept open for the retailing, dis-

pensing, and compounding of medicines, shall be under the direct personal care and management of a registered pharmacist.

2. And be it enacted, that any person not being or having in his employ a registered pharmacist, within the meaning of this act, who shall after the first day of January, one thousand eight hundred and seventy-eight, keep a pharmacy or store for retailing or compounding medicines, or who shall take, use, or exhibit the title of registered pharmacist, shall for every such offence, be liable to a penalty of fifty dollars; such penalty to be sued for and recovered by the board of pharmacy hereinafter mentioned, in the same manner provided by the statutes of this State for the recovery of penalties in other qui tam actions; provided, that nothing in this act shall apply to or in any manner interfere with the business of any physician, nor prevent him from supplying to his patients such articles as may seem to him proper, nor with the making or vending of patent or proprietary medicines, nor with the sale of the usual domestic remedies by retail dealers in rural districts.

3. And be it enacted, that on or before the first day of July, one thousand eight hundred and seventy-seven, and of every third year thereafter, the New Jersey Pharmaceutical Association shall submit to the governor the names of fifteen pharmacists, doing business within the State, out of which number the governor shall appoint five persons, who shall constitute the Board of Pharmacy of the State of New Jersey; shall hold office for the term of three years, and until their successors shall have been appointed and qualified, and within thirty days after their appointment, each person so appointed shall take and subscribe an oath before any officer authorized to administer an oath in the State, that they will faithfully and impartially discharge the duties prescribed by this act; and in case of the death, resignation, or removal from the State of any members of said board, the governor shall appoint in his place a pharmacist from among the fifteen names last submitted to him, to serve as a member of the board for the remainder of the term.

4. And be it enacted, that it shall be the duty of the board of pharmacy to examine all applications for registration, to grant certificates of registration to such persons as may be entitled to the same, under the direct provisions of this act, and to such others as it shall judge on examination to be properly qualified to practice pharmacy, to cause the prosecution of all persons violating the provisions of this act, and to report annually to the governor on the condition of pharmacy in the State; it shall meet at least once in three months, shall elect a president, a secretary, and treasurer, and shall have power to make by-laws for the proper fulfilment of its duties under this act; it shall keep a book of registration open at each county seat in the State, and shall give notice by advertising in at least one newspaper in each county, of the time and place in said county seat, when and where such book shall be accessible, and for what purpose kept.

5. And be it enacted, that within a period of ninety days after the publication of said notice, all persons who, at or prior to the passage of this act, have kept or continue to keep a pharmacy or store within this State, for dispensing and compounding the prescriptions of physicians, and for the retailing of drugs and medicines, shall apply to or appear before said board of pharmacy

for registration, and on payment of two dollars, shall receive from said board a certificate of registration.

6. And be it enacted, that all persons who, subsequent to the passage of this act, shall propose to establish a pharmacy or store within this State, for the dispensing and compounding of physicians' prescriptions, or for retailing of medicines, shall previous to the opening of the same to the public, appear before or apply to said board of pharmacy for registration, and if after examination by said board, in its judgment qualified to practice pharmacy, such persons shall on the payment of five dollars, receive from said board a certificate of registration; provided, that nothing in this act contained shall affect or apply to any person who holds a diploma from any regularly incorporated college or institute of pharmacy, or from a regularly chartered medical college or university.

7. And be it enacted, that the members of said board shall receive the sum of five dollars for each day actually engaged in this service, to be paid from the receipts of fees and penalties collected under the provisions of this act, and that all moneys received by the said board by virtue of the act empowering it to levy and collect contributions and prosecute for and recover penalties shall be paid into the treasury of the county in which the said moneys may be collected, and that the bills for the services of the said board, in said county, shall be audited and paid by the treasurer of said county, the balance, if any, after the payment of said bills, shall be added to the general fund of the county.

8. And be it enacted, that all other acts and parts of acts inconsistent with this act are hereby repealed.

9. And be it enacted, that this act shall take effect immediately.

Approved March 9th, 1877.

PHARMACY LAW OF NOVA SCOTIA.

AN ACT *to incorporate the Nova Scotia Pharmaceutical Society, and to regulate the Sale of Drugs and Medicines.*

(Passed the 4th day of April, A.D. 1876.)

WHEREAS it is expedient for the safety of the public, that all persons engaged in the sale or dispensing of drugs and medicines within this Province should be acquainted with their properties and uses, and possess a competent practical knowledge of pharmacy; and that provision be made for testing the knowledge and capability of all persons hereafter proposing to engage in the aforesaid business,

Be it therefore enacted by the Governor, Council and Assembly, as follows:

1. Thomas A. Brown, John K. Bent, Alexander Forsyth, Robert G. Fraser, William H. Simson, Henry A. Taylor, Thomas Walsh, William H. Webb, Henry L. Atkins, James W. Jackson, Frederick W. Fraser, and John W. Webb, and such other persons as shall hereafter be registered under this act, are hereby constituted a body corporate under the title of the "Nova Scotia Pharmaceutical Society."

2. There shall be a council of twelve members of the Society, to be styled the Pharmaceutical Council, to direct the affairs of the Society; and such council shall annually, at their first meeting after the annual general meeting of the Society, elect from their number a president, a vice-president, a treasurer, and a secretary, and appoint a registrar who shall be a member of the Society. The persons named in the preceding section shall be the council, and the officers they may elect shall be the officers of the Society, until other persons shall be elected in their room under this act. In case of any vacancy occurring in the council at any time, by reason of the refusal to serve of any person elected, or by the resignation or removal from the Province, or death of any member, or otherwise, it shall be lawful for the other members of the council to exercise all the functions and powers conferred upon the council by this act, until the next annual general meeting of the Society. Seven members present at any meeting of the council shall be a quorum for the transaction of business.

3. All persons who, at the time of the passing of this act, shall be actually engaged on their own account in the business of chemist and druggist within this Province, and all persons within this Province of the full age of twenty-one years, who, at the time of the passing of this act, shall have served seven years or upwards at such business, and during two or more of those years shall have been engaged in the dispensing of medicines and prescriptions, shall be entitled, upon giving to the council satisfactory evidence of such business or service, and upon payment of the fees hereinafter provided, to be registered under this act, and to become members of the Society. No person, however, shall be entitled to registration under this section after the thirty-first day of December, A.D. 1877.

4. There shall be a board of examiners, consisting of five persons, to examine into the qualifications for selling, dealing in, compounding, and dispensing drugs and medicines, of such persons as shall from time to time desire to be examined and registered under this act. Two of the examiners shall be appointed by the Provincial government, and three by the Pharmaceutical council. Every appointment of an examiner shall be for three years.

5. The board of examiners shall meet at least once in every year, for the purpose of examining candidates for registration and granting diplomas. Due notice of all such meetings shall be given by advertisement in one or more public newspapers in the city of Halifax. Every candidate for examination shall satisfy the council that he has served as assistant in a drug store for not less than three years, and during at least one of those years has been employed in the dispensing of prescriptions. He shall, before his examination, pay to the registrar a fee of five dollars. Any person failing to pass the examination may be re-examined without further payment of fees; but no person shall be entitled to a re-examination until after the lapse of at least six months from the date of his last examination. Every person passed by the board of examiners shall, upon payment of a further sum of five dollars, receive a diploma and shall be entitled to be registered, and to become a member of the Society at any time. The council may, at their discretion, accept the diploma of any other competent examining body, outside of the Province, as sufficient evidence of qualification, and may thereupon issue their certificate.

6. The registrar shall make and keep a register of persons who are members of the Society, and shall revise the same annually, on or about the first day of January, and publish the revised and corrected list in the month of January, in every year, in the "Royal Gazette." He shall receive examination and registration fees, as provided elsewhere in this act, and pay over the same to the treasurer, for the general uses of the Society; and shall give certificates under the seal of the Society to persons entitled to them.

7. Every member shall upon his registration (except holders of the diploma of the Society as hereinafter mentioned) and thereafter, on or before the thirty-first day of December, in every year, pay to the registrar such fee, not exceeding four dollars, as the council may determine, and upon every such payment shall receive a certificate under the seal of the Society. Any member failing to make any such payment shall forfeit his place upon the register, and shall cease to be a member of the Society, but his name may be replaced, at the discretion of the council, on payment of arrears of fees. Every holder of the diploma of the Society shall be entitled to a first certificate of registration without fees. Every member doing business as a druggist on his own account shall display his certificate in a conspicuous position in his place of business.

8. There shall be a general meeting of the Society, held in the city of Halifax, on the first Wednesday of June, A.D. 1876, at which six members of the Society shall be elected to be members of the council, to serve for two years, in the room of six of those mentioned in the second section, who shall retire by lot; and thereafter a general meeting of the Society shall be held annually, on such day in the month of June as the council shall appoint, for the transaction of such business as may be required, and at every such annual general meeting, six members of the Society shall be elected to be members of the council, to serve for two years in the room of six members of the council whose term of office shall then expire, and any vacancy or vacancies which may then exist in the council shall be filled by the election of a member or members to serve for one year. Retiring members shall be eligible for re-election. Persons entitled to vote at any meeting of the Society shall be persons who, at the time of holding such meeting, are upon the register of the Society, and no others.

9. The council shall have authority to prescribe the subjects upon which candidates for registration shall be examined and to make by-laws, rules, and orders for the holding and regulation of such examinations, and generally in connection therewith, for the regulation of their own meetings and proceedings, and those of the Society, and for the appointment and remuneration of the examiners and officers of the Society, and in respect to any other matters which may be requisite for the carrying out of this act. Such by-laws, as well as all rules or regulations made or prescribed for the examination of candidates, shall not go into operation until sanctioned by the governor in council.

10. From and after the first day of January, A.D. 1877, it shall be unlawful for any person to sell, or attempt to sell, or have exposed for sale, or keep open shop for retailing, dispensing, or compounding any of the drugs or medicines named in the Schedule A to this act, or which may hereafter be

added to such schedule by authority of the governor in council upon the recommendation of the Pharmaceutical Council, or to assume or use the title chemist and druggist, or chemist, or druggist, or pharmacist, or pharmaceutist, or apothecary, or dispensing chemist or druggist, in any part of this Province, unless such person shall be registered under this act, and unless such person shall have taken out a certificate under the provisions of the seventh section for the time during which he is selling, or keeping open shop for retailing, dispensing, or compounding such drugs or medicines, or assuming or using any of such titles; *Provided*, that this section shall not apply to nor prevent the sale of any such articles by wholesale, in market packages, nor of any of the articles commonly known as patent medicines.

11. The Pharmaceutical Council, with the concurrence of the chairman of the Provincial Medical Board, may, from time to time, by resolution declare that any poisonous or dangerous drugs, or medicines mentioned in such resolution, ought to be added to the Schedule A of this act, and may recommend that such articles be added to such schedule accordingly, and such recommendation shall go into force and effect when and so soon as it shall have been approved by the governor in council, and published in the "Royal Gazette" for the space of one month.

12. Any person transgressing any of the provisions of the tenth section of this act shall for the first offence incur a penalty not exceeding ten dollars and costs of prosecution; and for every subsequent offence shall incur a penalty of twenty-five dollars and costs of prosecution, to be recovered in a summary manner at the suit of the Pharmaceutical Council or Society in the Supreme Court, county or city court, or before any two justices of the peace or police magistrates, on the oath of one or more credible witnesses, which penalty and costs, in default of payment, shall be enforced by execution as in case of debt, and in default of sufficient distress, the defendant shall be liable to imprisonment in the common gaol for a period of not more than twenty-five days, unless such penalty and costs be sooner paid. Every such penalty when collected shall be paid to the treasurer for the general uses of the Society.

13. In any prosecution under this act it shall be incumbent upon the defendant to prove that he is entitled to sell or keep open shop for compounding and dispensing drugs and medicines and to assume and use the title of chemist and druggist, or other titles mentioned in the tenth section of this act; and the production of a certificate purporting to be under the hand of the registrar of the Society, showing that he is so entitled, shall be *prima facie* evidence that he is so entitled.

14. No person selling articles in violation of this act shall recover any charges in respect thereof, in any court of law or equity.

15. All legally registered medical practitioners are exempted from the operation of this act.

16. This act may be cited as the Nova Scotia Pharmacy Act, 1876.

Schedule A.

Acids: carbolic, muriatic, nitric, oxalic, hydrocyanic, or prussic; aconite and its preparations; aconitia; antimony, tartarized, or tartar emetic; arsenic

and its compounds and preparations; atropia and its salts; belladonna and its preparations; cantharides and its tincture; chloroform; chloral hydrate and croton-chloral hydrate; chloride of zinc; conium and its preparations; conia; colchicum and its preparations; creosote; croton seeds and their oil; cyanide of potassium, and all other cyanides; digitalis and its preparations; digitalin; elaterium; ergot and its preparations; essential oils of bitter almonds, cedar, rue, savin, and tansy; ether; euphorbium; Goulard's extract of lead; henbane and its preparations; hellebore, black, white, and green, and their preparations; Indian hemp and its preparations; iodine and its preparations; mercury, all poisonous compounds of, including corrosive sublimate, red and white precipitates, and iodides of mercury; morphia and its salts and preparations; nux vomica and its preparations; opium and its preparations, except paregoric; pinkroot; phosphorus; podophyllin; savin and its preparations; santonin; scammony; St. Ignatius' beans; stramonium and its preparations; strychnia and its salts and preparations; veratria and all poisonous vegetable alkaloids and their salts.

East Saginaw, Mich.,
August 25th, 1877.

John M. Maisch,
Chairman of Committee on Legislation.

Dear Sir: Four times have the druggists of Michigan, through the Michigan Pharmaceutical Association, gone to the legislature of the State and asked for legislation controlling the practice of pharmacy, and so far they have not succeeded in getting any action.

At the last meeting of the Michigan Pharmaceutical Association, held in Detroit, October 18th, 1876, President S. H. Wagener, of Muskegan, in his annual address, made the following remarks:

"There is one matter, gentlemen, of which I think we should not lose sight, and a consideration of which I would respectfully and earnestly urge upon you; that is the Pharmaceutical Bill which was brought before the legislature two years ago. It seems absolutely unaccountable that an intelligent body of men, as our representatives are supposed to be, should show so little interest in a matter that will give them almost a perfect security in the preparation of medicines, should be so utterly indifferent as to the capabilities of the men who are allowed to compound and deal out poisonous drugs. It would seem that any man, in taking a prescription to a drug store, should have the right to *know* that the druggist who has the compounding of it is one who, by an education in some recognized school of pharmacy, or by four years of active study and experience in the store, and under the supervision of some skilled and reliable druggist, has made himself competent for the responsibility. Our ex-President Garrigues will tell you how earnestly he labored with our legislators at Lansing, trying to show them how necessary it was that druggists should be competent for their business. I believe that the strongest opposition to the bill came from druggists themselves, from a mistaken idea that they were to be legislated out of business, the fact being that

the law could not affect those already in the trade, but operate only to prevent persons going into the business who knew nothing about it. A pardonable pride *in*, and a laudable zeal *for*, the welfare of our State, makes this association desirous that she shall not in any progressive measure fall behind her sister States, many of whom have already passed such laws as the one referred to, and found them eminently beneficial. I would suggest, therefore, that another committee be appointed to go to Lansing this winter, and bring the bill before the legislature, and that they may be empowered to make such changes in it as may seem advisable."

At a later session the business committee offered the following resolution:

Resolved, That the recommendations of the president regarding a legislative committee to look after the passage of the pharmacy act be carried out by the appointment of such a committee, consisting of the president, one member from Lansing, and one member from Detroit.

After some lively discussion, the following amendment to the resolution was adopted:

Resolved, That a committee, consisting of S. S. Garrigues, of East Saginaw, and P. D. Northrop, of Lansing, be, and are hereby appointed to present again to the legislature of the State of Michigan the Pharmacy Bill prepared by the association, with such alterations as may to them seem necessary, and while recommending an economical policy, guarantee their necessary expenses.

Acting under this resolution, Mr. James Vernor, secretary of the association, and the writer, went early to work, prepared an improved bill, which was published with the proceedings of the association. As soon as the legislature convened, this pharmacy bill was introduced by Mr. Stafford, a druggist, and member of the House of Representatives from Marietta. The bill was referred to the Committee on Public Health, most of the members of this committee being physicians They were afterwards interviewed personally, and the merits of the bill fully explained. Other means were taken to bring the question to the attention of the legislature, such as letters from prominent pharmacists of the State indorsed by well-known citizens. But with all our exertions we could only get the bill reported back to the legislature without any recommendation, and this only at a very late day in the session.

This action of the committee practically killed the bill, and we thus had the great disappointment of seeing the fourth attempt to pass a pharmacy bill frustrated. We are discouraged, but I am satisfied that we will make up our minds to go before the legislature at the next session, asking for action upon our bill. The bill is very much like the Kentucky pharmacy act, with the addition of clauses controlling adulterations and the sale of poisons.

Yours respectfully,

SAMUEL S. GARRIGUES.

SPECIAL REPORTS AND ESSAYS.

I. PHARMACY.

ON THE REQUISITE THERAPEUTICAL KNOWLEDGE OF PHARMACISTS.

BY BENJAMIN T. FAIRCHILD, NEW YORK.

QUERY 41.—What knowledge of therapeutics should the properly educated pharmacist possess?

THE complex considerations involved in the discussion of this subject, the variety of opinions held in regard to it, modified as they will be in each individual by the influence of early training, and the environments under which his profession is practiced, and the plausibility with which they may severally be urged, all render difficult, indeed, seemingly presumptuous, an attempt to definitely answer this query. It will, however, be discussed from a standpoint which seems to the writer to be just and in accord with the spirit and tendency of the times. The writer will advocate the strict adherence of pharmacy to its special legitimate functions; and this is important in determining the therapeutical knowledge necessary to the practice of pharmacy. It may be safely premised that the curriculum of the schools of pharmacy, in an admirable degree, provides for the necessities and exigencies of the practice of pharmacy, and is consequently competent to guarantee *proper education* to the pharmacist. If this, then, be conceded, the deduction will be logical that to the degree therapeutics are taught in our colleges, so may be estimated its importance, its relevancy to pharmacy. While the science of therapeutics embraces an extensive range of knowledge, it is peculiarly the province of medicine; it appertains in its specific and conventional signification to the cure and alleviation of disease. It is in its relation to pharmacy in this its objective sense that the critical interest in this query is involved. Therapeutics embrace Materia Medica and

chemistry. Of all the substances used in the treatment of disease the student is instructed in, and with the proper practical experience becomes thoroughly acquainted with their physical characteristics, nature, chemical composition, medicinal properties, and mode of administration. All this knowledge he is taught, and must possess, in order that he may intelligently and safely practice pharmacy. It enables him to co-operate with the physician; to suggest, to introduce new remedies. With this education the pharmacist will be competent to discharge the important relations he assumes toward the public. He becomes, indeed, a conservator of the public health. In what degree can these attainments be said to constitute a knowledge of therapeutics? In "Royle's Materia Medica" the following language is held:

"In order to employ drugs with certainty for the relief of suffering or the cure of disease, we must seek to know what part they will take in the chemical and physical processes upon which life depends, for this really constitutes the science of therapeutics." "The study of therapeutics is a very complex one, and resolves itself into a consideration of

"1st. The changes undergone by the drug itself. 2d. Its effects upon the body generally, and on certain parts in particular. 3d. The mode of its action. 4th. The difference, if any, in its action on the healthy and diseased condition of the body."

It cannot be said that the pharmaceutical student is thoroughly instructed in any of the considerations above enumerated. In his education they are of collateral importance. They are concisely treated of only as they are essential to a certain end,—the practice of pharmacy. The pharmacist is not instructed in the symptoms of disease, nor in the observation of the action of drugs; nor can his practice be said to afford opportunity for the acquirement of intimate and reliable knowledge of them. The pharmacist should possess such acquaintance with therapeutics as relates to the medicinal properties, uses, and doses of every agent of the Materia Medica. This is an absolutely necessary qualification, and this he has been shown to be instructed in. It is a patent fact that the pharmacist is esteemed by the public to be able, and is required, to give advice and instruction in regard to such drugs and remedies as they may desire to use in the ordinary household practice. There can be no doubt of the right of the pharmacist to give such advice, nor can its expediency be questioned. He is often asked to afford relief in slight or seemingly trivial ailments. The conscientious

pharmacist will be reluctant to undertake this responsibility. The pharmacist is not qualified to make a diagnosis. It will be said that in some localities he is obliged to do a great deal of prescribing; the absolute necessity for such practice is not beyond question. As a rule, the physicians evince no desire to infringe upon the practice of pharmacy. The reciprocal relations of the pharmacist and the physician are such, that it is, if from no other reason, inexpedient for the one to encroach upon the province of the other.

The writer by no means wishes to be understood to esteem the status of pharmacy as in any true sense subservient to medicine. On the contrary, he advocates a jealous maintenance of its independence and dignity. He believes that any culture in therapeutics which the pharmacist may be able to acquire, or in any other collateral science, will not fail to add to his usefulness in his profession, enhance his appreciation of that profession, and render him by no means more prone to overstep the limits of his duties than he who has a low estimation of the requirements of pharmacy, and is therefore not likely to respect the province of medicine.

ON CONFECTION OF SENNA.

BY ADOLPH W. MILLER, M.D.

QUERY 5.—The present officinal formula for the preparation of confection of senna directs the use of Cassia fistula, a drug not always easily obtained, and consequently has caused the substitution of other and less active drugs. Cannot this formula be modified, or the Cassia fistula substituted by some drug more generally in use?

THE above proposition contains several assertions, which are so broad and sweeping in their character that it was deemed best to modify them somewhat before entering on the subject proper. As far as the knowledge of the writer extends, there has not, for many years, been any difficulty in obtaining Cassia fistula in the Philadelphia or New York markets. On the contrary, it can be readily procured from the better class of wholesale druggists at a comparatively trifling price and of very fair quality. For the purpose of securing information in relation to the second point, namely, the substitution of other drugs, personal inquiries were made at five Philadelphia establishments preparing confection of senna on a manufacturing scale, and it was found that in every case the process of the Pharmacopœia was closely adhered to. No serious

trouble had been experienced in obtaining the Cassia fistula, nor had there been any object in attempting to substitute it.

Reverting to the more immediate question, as above stated, we find that the confection of senna embraces in its combination four drugs usually ranked as laxatives, namely, purging cassia, tamarinds, prunes, and figs. None of the authorities, as far as these were examined, claim any special virtues for purging cassia over and above those possessed by the other drugs named. Dr. H. C. Wood even rather deprecates the employment of Cassia fistula by stating that it is apt to cause griping, a property not attributed to the other three.

The tendency of modern medicine being decidedly towards the simplification or abolition of the formulas of bygone days containing multitudinous and very often even heterogeneous drugs, it would naturally seem best to dispense with this article by simply increasing the relative proportion of the other three laxatives rather than to burden our Pharmacopœia with still another new name. There appears to be some doubt in reference to the therapeutic value of the *pulp* of figs, inasmuch as the laxative properties of this fruit are by some authors attributed chiefly to the mechanical irritation produced on the mucous membrane of the intestines by the very great number of small seeds contained in it. These, of course, are excluded from the pulp by the straining through a fine hair sieve, which is prescribed by the Pharmacopœia. For this reason it appeared most advisable to increase the relative proportion of tamarinds and prunes sufficiently to make up for the absence of the Cassia fistula. In all other respects, the formula of the U. S. Pharmacopœia was closely adhered to, modified as follows:

"Take of	Senna, in fine powder, . . .	8 troy ounces.
	Coriander, in fine powder, . .	4 "
	Tamarind, ...	16 "
	Prune, sliced, ...	17 "
	Sugar, in coarse powder, . . .	30 "
	Water, a sufficient quantity.	

"Place the tamarind, prune, and fig in a close vessel with three pints of water, and digest for three hours by means of a water-bath. Separate the coarser portions with the hand, and rub the pulpy mass, first through a hair sieve, and then through a fine one, or through a muslin cloth. Mix the residue with a pint of water, and, having digested the mixture for a short time, treat it as be-

fore, and add the product to the pulpy liquid first obtained. Then, by means of a water-bath, dissolve the sugar in the pulpy liquid, and evaporate the whole until it weighs 84 troy ounces. Lastly, add the senna and coriander, and incorporate them thoroughly with the other ingredients while yet warm.

"The whole should weigh 96 troy ounces."

To insure a moderate degree of stability, it is very necessary that the evaporation is continued to the exact point as stated, in order to prevent the preparation from fermenting or becoming mouldy. Sometimes, particularly during hot and damp weather, mould will appear even after the most careful manipulation. On one occasion, the efficacy of substituting one-half the sugar by an equal weight of glycerin was tried, but the fungi appeared to flourish quite as well on this pabulum as on the other. It might, therefore, be a matter of interest to determine the value of benzoic and salicylic acids or other antizymotics, investigating, at the same time, as to how far such additions would tend to modify or impair the therapeutic value of the preparation.

It may be remarked, in this connection, that the Pharmacopœia of the German empire has carried the process of simplification even much farther than is proposed above. In the evolution of its equivalent preparation, the *Electuarium e Sennâ*, from complexity, the "struggle for existence" among its ancient ingredients has been so sharp that the present national volume records "the survival of only four of the fittest." The formula, in brief, is to mix 10 parts of powdered senna with 1 part of powdered coriander, and to add 50 parts (by weight) of simple syrup, and 15 parts of the purified pulp of tamarinds. These are to be heated on a vapor-bath, so as to make a thick, greenish-brown electuary, which is directed to be preserved in a cold and dry place.

As this formula appears to have arrived at the terminal expression of simplicity, embracing as it does in its composition only a single purgative, corrective, adjuvant, and laxative, it would, in reality, seem to be the most appropriate solution of the present query.

PHILADELPHIA, August 11th, 1877.

ON ALOIN.

BY ALBERT P. BROWN, CAMDEN, N. J.

QUERY 40.—What is the relative therapeutic value of aloin as compared with aloes? Can the former be used as an efficient substitute for the latter?

IN order to ascertain the relative therapeutic value of aloin, as compared with aloes, the writer prepared some aloin according to the process of Mr. Tilden.

One pound of Barbadoes aloes was dissolved in one gallon of hot water, acidulated with a half fluid ounce of sulphuric acid; it was then set aside for twenty-four hours to cool, then carefully decanted and evaporated to about two pints; it was then set aside for two weeks, the deposit was collected on a filter, washed with ice-water to remove the coloring-matter, well drained, and dried.

The following experiments were then made with the view of observing its effects:

Three grains of Barbadoes aloes were taken at bedtime; in the morning the bowels were freely moved.

A few evenings after taking the aloes the writer took three grains of aloin; the purgative effect was about the same as the aloes; the writer could discover no difference in the action, only the aloin did not gripe. A few days after the same experiments were repeated, and the results were the same.

Fifteen grains of the resin which had been thoroughly exhausted of aloin, were taken at bedtime, and it had no purgative effect whatever; the same dose was repeated, and the result was similar.

The mother liquid, after the separation of the crystals of aloin, was evaporated to the consistence of an extract, and taken in doses of fifteen grains without any purgative effect.

The writer purchased some aloin made by Smith, of Edinburgh, and repeated the experiments, but could discover no difference whatever in its action.

I think the above experiments will prove that the results claimed for the administration of aloin as a substitute for aloes have not been realized, and that the resin and extract when deprived of aloin are inert. The reason the extract was experimented with was this: Some time ago a writer on aloin stated that the liquid from which the aloin had been separated, when evaporated to the consistence of an extract, yielded a good article of extract of aloes. I beg leave to differ. The mother liquid, after the separation of

aloin, evaporated to the consistence of an extract, possesses no purgative properties.

In conclusion, I will merely repeat what Nelson C. Dobson and W. A. Tilden say about aloin, and that is as follows:

"Barbaloin, nataloin, and zanaloin are more or less aperient in doses of two grains, barbaloin being apparently more active in combination with hard soap than with conserve of roses. They are, each of them, decidedly uncertain and variable in their action; the time which elapsed after the administration, before there was any perceptible action, varied from two hours and a half to fifteen hours. The crystalline principle did not appear to be more potent than a similar dose of aloes, nor was any advantage discovered over a similar dose of aloes, except perhaps, that griping was less common than when aloes alone was given."

EXTRACT OF ALOES.

BY GEO. W. KENNEDY, POTTSVILLE, PA.

QUERY 16.—Is there any difference in the quality or quantity of aqueous extract of aloes when prepared with boiling or with cold water?

IN response to this query the writer would say, before proceeding further, that it is a well-established fact, and generally known to the pharmaceutical profession, that the medicinal qualities of aloes are not equal in various samples, that of two specimens of the same variety, one may have purgative properties twice as strong as the other, one may be mild, gentle, and unirritating, comparatively speaking, while the other is decidedly harsh in its action, often producing hæmorrhoids, and, where they already exist, aggravating them to such an extent as to give rise to considerable pain.

It is also well known that aloes of good quality is often mixed, as found in commerce, with many accidental and sometimes intentional impurities, such as pieces of wood, small stones, earthy matter, pieces of goatskin, hair, and shreds of the aloe plant; and in order to make sure that the article operated upon was free from all of the aforesaid impurities, which sometimes amount to twenty per cent. of the drug, the writer prepared aloe purificata of the Pharmacopœia by heating socotrine aloes by means of a water-bath until it was completely melted, then adding a small quantity of alcohol, stirring the mixture thoroughly, straining through a fine sieve, which

had been previously heated by dipping in boiling water, and evaporating the strained liquid to the required consistence. This I consider is the only form of aloes to manipulate with so as to be able to arrive at a definite and satisfactory conclusion, and in fact it is the only form in which it should be used in the manufacture of the various galenical preparations into which it enters; the ordinary commercial article is only fit for and should be used exclusively by veterinary surgeons in their practice. Therefore, in pursuing my investigation of this query, particular attention was given by the writer to see that the aloes used was taken from the same package, otherwise the inference might be made that different varieties were manipulated with. The following is an outline of the course followed in preparing the extracts as called for in the query:

Process by Hot-water Extraction.

The aloes was macerated with a small quantity of boiling water kept at a temperature of 200° to 212° F. for fifteen minutes; the decoction was then set aside to subside, and the clear solution poured off. Repeated maceration of this kind was kept up until the drug was thoroughly exhausted. Subsequently the solutions were mixed, and evaporated by means of a water-bath to the proper consistence. In preparing this extract great care is absolutely necessary, both in the maceration and evaporation, so as not to raise the temperature too high, otherwise there might be danger of impairing the virtues of the drug.

Cold-water Process.

This process consists of mixing the aloes with an equal quantity of sand, the aloes being previously powdered; moisten with cold water, pack in a conical-shaped glass percolator, and pour on sufficient cold water until the drug is completely exhausted; evaporate the infusion to the required consistency.

Yield.

One hundred and fifty (150) grains of the drug were operated upon in the preparation of the above extracts, with the following results:

By cold water extraction, yield 70 grains, or $46\frac{67}{100}$ per cent.
By boiling water " " 124 " or $82\frac{67}{100}$ "

It will be observed from this statement that the yield by the hot-

water extraction is greater by 54 grains, or 36 per cent., than by the cold-water process.

Therapeutic Action.

This I find the most difficult part of the query to determine. The writer made a large number of pills, some of which contained the cold, and some the hot-water extract, and gave them to his customers who were in the habit of taking a laxative pill occasionally, one of the ingredients of which being a selected article of socotrine aloes, and in every case the pills prepared with the extract were found to be much quicker, and by far more active, than those which they had been accustomed to using, and in every case I found the pills made with the cold-water extract much more active. And in order to arrive at a more satisfactory and correct conclusion, the pills were used alternately, the cold-water at one time, and the hot-water the next, and so on in that way, and in every instance I found the pills containing the cold-water extract decidedly more active.

I would, therefore, from all the information I have been able to obtain, and also from my own observations, make the following report:

1st. It requires a much smaller dose of the cold-water extract, two grains being equal to about three of the hot-water, to produce the same effect.

2d. The cold-water extract does not cause so much griping or pain.

3d. The aromatic odor in the cold-water extract is much stronger, which makes the medicine more palatable, and less apt to gripe.

4th. The yield by the hot-water is greater by thirty-six per cent. than by the cold-water extraction.

ON BONJEAN'S ERGOTIN.

BY GEORGE ZELLHŒFER.

Query 27.—Ergotin by Bonjean's method. Determine the yield when using alcohol of different strengths for the extraction of the aqueous extract, and give a working formula to secure a uniform result.

In answering this query it is not necessary for me to mention Wiggers, Winckler, and Wenzell's processes for obtaining ergotin, as they are entirely different from that obtained by Bonjean's

method. They were all published in some of our Proceedings and other pharmaceutical works.

Bonjean's method for obtaining ergotin is to exhaust fine ground ergot with distilled water, and evaporating the infusion on a water-bath to the consistency of honey, then adding a large excess of alcohol to the extract, with constant stirring, to precipitate all the gummy substance; set it aside for twenty-four hours, filter, and evaporate it on a water-bath to the consistency of a soft extract. This process is also recommended by the German Pharmacopœia.

There is certainly a great difference in the so-called ergotins found in our market, as some manufacturers use strong alcohol, and others very weak alcohol, for preparing the aqueous extract. The weaker the alcohol used, the greater the percentage will be containing a large quantity of inert matter, as the subjoined table will show.

In order to obtain a uniform and reliable preparation, it is necessary to select good rye ergot free from all seeds of the various weeds, and other impurities which are frequently found in ergot.

To determine the yield of ergotin when using alcohol of different strengths, I proceeded as follows: 4 pounds (avoirdupois) of fine ground ergot were macerated in 12 pints of water for twelve hours, then strained and pressed; to the residue another 12 pints of water were added, and treated in the same manner as before. The two liquids were then mixed, filtered, and evaporated to 16 ounces by weight.

This aqueous extract was divided into four equal parts (each lot respectively numbered from 1 to 4), and 16 fluid ounces of alcohol were added (for strength of alcohol used, see table below) to each lot of extract, and set aside for twenty-four hours, with occasional stirring, to precipitate the gummy substance. I then filtered and evaporated each lot separately on a water-bath to the consistency of a soft extract. The four examples of ergotin were all the same degree of density.

The following table will show the yields of ergotin obtained from four samples of ergot:

No.	Specific gravity of alcohol used.	Yield of ergotin obtained from one pound of ergot.		
1,	.817	630 grains	=	9 per cent.
2,	.832	800 "	=	11.5 "
3,	.860	1050 "	=	15 "
4,	.893	1700 "	=	24.5 "

So great a variation in the alcohol employed might reasonably be expected to yield products varying much in their physiological actions.

The strength of alcohol that has been proved to be the most satisfactory for extracting the aqueous extract, is alcohol of the specific gravity of .832.

The following working formula for "ergotin," if carefully followed, will prove satisfactory:

Take of Fine ground ergot, ...	16 ounces.
Distilled water (cold), ...	3 pints.

Macerate for twelve hours, strain, and express, and add to the residue distilled water, cold, 3 pints, and operate as before. Mix the two liquids and filter, then evaporate to 4 ounces by weight on a water-bath. Add alcohol, specific gravity .832, 16 fluid ounces; mix the alcohol with the aqueous extract, set aside for twenty-four hours, then filter, and recover the alcohol by distillation, and evaporate to an extract. Care should be taken to use as little heat as possible. The yield is about 11.5 per cent.

Ergotin, prepared according to this process, has a dark-red color, and is perfectly soluble in water. It should be kept in a dark place, and not exposed to the air.

As ergotin is extremely unstable, Mr. D. Benjamin has recommended a small percentage of salicylic acid to be added for its preservation.

ON RESIN OF SCAMMONY.

BY PROF. GEORGE F. H. MARKOE, BOSTON, MASS.

QUERY 59.—Can the formula for Scammony resin (U. S. P.) be improved, and what is the objection, if any, to the exhaustion of scammony by alcohol at ordinary temperatures and simple evaporation of the tincture?

IN order to properly answer this query, a number of samples of scammony were obtained, and the amount of resin of scammony that they contained carefully determined by the process of the U. S. Pharmacopœia. Portions of the same samples were simply exhausted with alcohol, both hot and cold, and the tinctures evaporated to dryness, and the amount of alcoholic extract weighed.

Experiment 1.—One hundred grains of a sample of powdered scammony sold as "pure virgin scammony" by a Boston firm for $13 per pound, were treated with hot alcohol till exhausted, and

the tincture evaporated to a syrupy consistence, and then poured into water. After washing the precipitated resin with repeated portions of water, it was dried in a tared capsule on a water-bath, and then weighed.

The yield of resin was sixty-three (63) grains = 63 per cent.

Experiment 2.—One hundred grains of the same lot of powdered scammony used in Exp. 1, were treated with hot alcohol as before, and the tincture evaporated to dryness in a tared capsule by the heat of a water-bath, and then weighed.

The yield of *alcoholic extract* was found to be *sixty-five* (65) grains.

Experiments 3 *and* 4 were repetitions of Exp. 1 and 2, with substantially the same results.

Experiment 5.—Two hundred (200) grains from a lot of scammony, warranted by the seller to contain not less than 75 per cent. of resin, were treated by the U. S. P. process for scammony resin. The result was a yield of one hundred and fifty-three (153) grains of the officinal resin, equal to 76.5 per cent.

Experiment 6.—Two hundred (200) grains of the same lot of scammony that was used in Exp. 5 were exhausted with hot alcohol, and the tincture evaporated to dryness as in Exp. 2. The yield of alcoholic extract was one hundred and fifty-six and one-half (156.5) grains, equal to 78.25 per cent.

Experiments 7 *and* 8 were repetitions of Exp. 6 and 7, and confirmed the results obtained in Exp. 6 and 7.

Experiments were made in which the scammony was exhausted with cold alcohol, but the results were not materially different. The process, however, was not so quickly executed, and required the use of much more alcohol.

It seems from the results of my experiments that the alcoholic extract of scammony is nearly identical with the scammony resin of the U. S. P. Washing the resin with water seems to remove only about 2 per cent. of matter soluble in water. This small amount of impurity is practically of no account, and since its removal is somewhat troublesome the simple alcoholic extract, made by digesting the scammony in hot alcohol, and distilling off or evaporating the alcohol, seems to be a product quite pure enough for pharmaceutical use.

Boston, August, 1877.

ON GLYCERIN IN FLUID EXTRACTS.

BY J. U. LLOYD, CINCINNATI.

QUERY 32.—Glycerin is extensively employed in the manufacture of officinal and unofficinal fluid extracts. What articles are proven by actual experience in the laboratory to be improved by the addition of glycerin?

THERE are thirty-four fluid extracts which the U. S. Pharmacopœia directs to be made with glycerin in the menstruum.

My experience teaches me that glycerin is of decided advantage to the following:

Pipsissewa,
Cinchona,
Dogwood,
Geranium,
Gossypium,
Rhatany,
Matico,
Prunus,
Rubus,
Uva ursi.

In those which follow I cannot find that glycerin is superior to water:

Belladonna root,
Calumba,
Colchicum root and seed,
Gentian,
Sarsaparilla,
Sarsaparilla comp.,
Spigelia,
Dandelion,
Digitalis,
Hydrastis,
Senega,
Stillingia,
Ergot,
Ipecac,
Hyoscyamus.

I have not had experience, excepting in a small way, sufficient to warrant me in reporting upon

Conium seed,
Bittersweet,
Pareira brava,
Spigelia and senna.

I have made considerable amounts of, and experimented a great deal upon

Liquorice root,
Rhubarb,
Senna,
Squill,

but have not arrived at a conclusion satisfactory to myself.

And in what manner does the beneficial power of glycerin in such extracts exhibit itself?

My opinion has been for some years that glycerin extracts vegetable astringent principles and holds them in solution better than water does, and consequently is of advantage to certain fluid extracts. My experiments in a small way, and my experience in the laboratory with officinal and unofficinal fluid extracts, led me to the belief, and as yet I can explain the question in no other manner.

NOTE ON OFFICIAL FLUID EXTRACTS.

BY J. U. LLOYD, CINCINNATI, O.

In another communication will be found an answer to Query 32, in addition to which I offer the following notes, as being somewhat connected but not actually embraced within said query.

I understand that the Pharmacopœia is intended to give in an authoritative way working formulas which will furnish, by careful attention to directions and the employment of prime materials, a line of fluid extracts which will be the same wheresoever and by whomsoever made.

An official fluid extract should contain the principles extracted from the crude drug in an unchangeable form, if possible, representing the drug medicinally troy ounce to fluid ounce as nearly as it can be made to with the menstruum and the process of the Pharmacopœia.

As a step in this direction, the Pharmacopœia explicitly directs the employment of powders of certain degrees of fineness, a very essential point for the production of reliable fluid extracts, but even with the same powder and menstruum, due care being given to moistening and packing the powder into the percolator, the quality of the extract is influenced by the size of the percolator to a greater extent than is generally supposed. And all other conditions being the same, this one point may render fluid extracts entirely different, for the utmost care may be neutralized by the employment of percolators of various diameters.

The Pharmacopœia is silent upon this subject. It overlooks the height a given amount of powder should occupy. This point is, in my opinion, of vital importance, and should in every instance be specified.

I am not in favor of funnels for percolating. In my belief, cylindrical percolators only should be used. I cannot conceive of an

example where the sentence of the Pharmacopœia, "In cases in which these variations of the instrument are indifferent," can be applied to the preparation of a fluid extract.

I do not think the glass cylindrical percolators upon the market are adapted to the preparation of as small an amount as one pint of a fluid extract. According to my experience, a powder should occupy at least fifteen inches in height, and I have never seen a percolator for sale which would permit this.

The following six fluid extracts will, in my opinion, be improved if made of strong alcohol, instead of the menstrua directed by the Pharmacopœia. The finished extracts will not be as dark in color, nor of as great a specific gravity as at present, but my experience is, each will give perfect satisfaction to physicians physiologically, and be more stable and elegant than any fluid extracts of the same article I have made with menstrua composed of mixtures of alcohol with glycerin and water. The first three upon the list will be of a greenish color:

Digitalis,
Hyoscyamus,
Matico,
Belladonna root,
Hydrastis Canadensis,
Stillingia.

If the present process is retained in part for preparing four of the preceding fluid extracts, and two others, namely:

Belladonna root,
Hyoscyamus,
Matico,
Stillingia,
Colchicum root,
Colchicum seed,

and is changed so that the operation is finished with a menstruum consisting of three parts of alcohol to one part of water, the extract will be less prone to precipitate under the influence of time, temperature, and atmospheric exposure than as made now. The therapeutical value of the extract will not be lessened.

For the same reason, to finish fluid extract of hydrastis and calumba I prefer a menstruum composed of seven parts of alcohol to one part of water.

I have failed to derive the benefit expected from the use of acetic acid in fluid extract of ergot. I gave the present process an ex-

tended and careful trial, and do not favor it. My experience is, a menstruum consisting of one part of alcohol to three parts of water, continued throughout the entire operation, yields a better preparation. Its simplicity, and the small amount of alcohol used, may strike some unfavorably, but reports from physicians compel me to favor the formula.

A few specimens of gelatinized fluid extract of gossypium have been shown me since our last meeting, none of my own make though, excepting one vial of the extract of fresh gossypium furnished a physician. It solidified in about six months from the time of its preparation. I had expected more reports of this nature from the extract of the fresh bark, as it contains considerable water.

Officinal fluid extract of geranium sometimes gelatinizes. If the formula recommended for gossypium, in my last report to this Association, be adapted to this article, the trouble will be overcome, and a preparation obtained which will meet with the favor of physicians.

I cannot satisfy druggists and physicians with the officinal fluid extract of ipecac. Not that it is unfavorably reported upon from a physiological point, but because it becomes muddy and deposits considerable sediment, and will not make a good-appearing syrup. I meet with no trouble from an extract prepared by a process somewhat similar to that of the preceding Pharmacopœia, and suggest, as an improvement upon the old formula, to add eight fluid ounces of water and the acetic acid to the percolate before evaporation, which (evaporation) is to be continued until the liquid is reduced to the measure of eight fluid ounces. That the *boiling* be dispensed with, and after the eight fluid ounces of liquid has cooled, it be added to a like bulk of cold distilled water, and permitted to stand twelve hours, when it is to be filtered. Evaporate the filtrate to eight fluid ounces, and add alcohol enough to bring to the measure of sixteen fluid ounces.

ON SYRUP OF IODIDE OF IRON.

BY L. MYERS CONNOR, DALLAS, TEXAS.

Having obtained of a wholesale drug establishment a pound of syr. ferri iod., on opening the same I was a little surprised at its deep green color. Knowing that it was not what the United States

Pharmacopœia recognized as being the characteristic color, I became so decided in mind that something was wrong, I made an examination for anilin green by the addition of a few drops of dilute nitric acid, which at once discharged the green color. No such effects are produced with the United States Pharmacopœia preparation. This is a great deception and a hazardous fraud, merely to conceal its deficiency in strength, and should be watched by the pharmacist, if for nothing more than to do justice to those to whom justice is due.

ON EMULSION OF ALMONDS.

BY EDMUND GREGORY, LINDSAY, ONTARIO.

QUERY 56.—In preparing emulsions of almonds and other seeds, considerable force is required to reduce the seeds to a uniformly smooth mass in order to insure their exhaustion with water. Query. What is the best shape and material for mortars adapted to this purpose?

IN responding to this inquiry, I regret that I have not been able to arrive at results that are perfectly satisfactory, but as some experiments have been made, and as they seem to a certain extent instructive, they have been recorded. I give them in the order in which they were made.

In each case the formula of the United States Pharmacopœia was used, consisting of

Sweet almonds,	½ troy ounce.
Gum arabic, in fine powder,	30 grains.
Sugar,	120 grains.
Distilled water,	8 fluid ounces.

No other seeds than those of the almond have been experimented with, because it seemed certain that the apparatus suitable for one would answer for all others.

As each emulsion was prepared it was strained through muslin, and the residue remaining on the strainer was set aside on a porous tile to dry in the air, and was afterwards weighed, it being thought that the amount of almond dissolved in the emulsion, together with the degree of whiteness exhibited by the finished product, would serve as an approximate measure of the success of the several operations.

1. My first trial was made with a Wedgwood mortar, six inches inside diameter, glazed inside, and slightly flattened at the bottom. No result worth writing was observed.

2. A Wedgwood mortar, not glazed, five and a quarter inches inside diameter, much rounder at the bottom than the preceding, was used. The labor and time required were about the same. In whiteness it ranked third. The air-dried residue remaining in the strainer weighed thirty-five grains.

3. It occurred to me that perhaps some inert powder might assist in the comminution of the almond, and in pursuance of this idea an addition of two drachms of carbonate of magnesia was made to the above formula, and the mass well triturated. The result was a very white emulsion, but no decrease in the time or labor required. It was very evident that considerable quantities of magnesia had passed through the filter. The air-dry residue weighed eighty-nine grains, and in whiteness the emulsion ranked second.

4. A tinned iron mortar with an almost flat bottom was next tried, but whilst no advantage in time and labor was gained, it was found that the emulsion was decidedly darkened. It ranked last in order of whiteness. The residue weighed sixty-four grains.

5. A gentleman who has had considerable experience, having recommended that the almond, instead of being reduced to paste in a mortar, should be rubbed through a sieve, the experiment was tried. After blanching the almonds, three or four of them were taken in the fingers and carefully rubbed on the surface of a brass wire sieve of forty meshes to the inch until as much as possible had been passed through. The process was found to be very tedious, and there was a little waste which could not be got through the sieve. In whiteness this emulsion ranked fourth. The air-dry residue weighed forty-one grains.

6. In the next experiment a Wedgwood mortar of eight and a half inches inside diameter was used, hoping by the increased weight of pestle and size of mortar to reduce the labor, but unfortunately without any effect in this direction. The trial was not, however, without some slight results, for, contrary to the usual custom, a little water was added to the almond whilst it was being beaten into a paste, the effect of which seemed to be that the oil was not raised by the action of the pestle, and the color of the emulsion was consequently much improved. In whiteness it ranked first beyond all dispute, and the air-dry residue weighed fifty grains.

7. An attempt was made to grind the almond in a common coffee-mill, but on account of the raising of the oil, and the consequent caking of the mass, this was a total failure.

It was also intended to try the effect of a brass and of a marble mortar, but neither could be obtained in the locality in which I live, and judging from the comparative uniformity of results obtained in the trials reported above, it did not seem of importance to procure them purposely.

In view of the experiments recorded in this paper, I arrived at the following conclusions:

The blanching of the almonds is the most tedious part of the process.

After blanching, the almond should be reduced to a smooth paste before adding the sugar and gum of the formula. This is best done in a Wedgwood mortar with a slightly flattened bottom, and of not less than five inches inside diameter, for the quantity contained in the formula at the head of this paper. After breaking the almond into small pieces with a few blows of the pestle, a very little water should be added, and the whole well beaten until it becomes a smooth paste. If the mass seems dry or oily, a little more water should be sprinkled on it. This course seems to prevent the raising of the oil, and notably improves the color of the product. The gum and sugar being now added, the whole may be rubbed, with the water gradually added.

Made in this way, or in any other way that I have tried, emulsion of almonds is a very unstable preparation, those samples which I prepared having invariably become so decomposed as to be unfit for use in forty-eight hours, whenever the temperature ranged from 70° to 80° F.

I have lately had the opportunity of conversing with a gentleman who has an experience of sixty-five years as a pharmaceutist, a considerable period of which he spent as manager in a fashionable dispensing establishment at the city of Bath, in Great Britain. At this place two quarts of emulsion of almonds were sometimes used in the day. He informs me their plan was to prepare a quantity of confection of almonds every three or four days, it being found not to keep in good condition very much longer than that. The almonds were blanched in cold water, for which purpose they would need to soak three or four hours. They were then carefully dried at a low heat in a current of air, and powdered in a large marble mortar. A heavy marble pestle, with long handle fixed in a socket overhead, was used, and the work of powdering was done almost entirely with a rubbing or triturating motion. I have had

no time to try this plan, and it does not seem to me that it would be useful unless there were great and constant demand for the preparation.

OLEATE OF MERCURY,

And Ointments of the Oleates of Mercury, Morphia, Quinia, Aconitia, Atropia, Etc.

BY WILLIAM SILVER THOMPSON, BALTIMORE, MD.

Query 15.—The oleates of mercury, morphia, etc., have of late years been introduced into medical practice with considerable success. Give a standard set of formulas for their preparation, together with, if possible, a convenient and comparatively simple process for preparing pure oleic acid.

Various plans have been proposed for preparing oleate of mercury in a convenient form for application to the skin. The writer, a year or two since, adopted the method of direct combination of oleic acid with moist recently precipitated mercuric oxide, with success; but found the preparation so made was not permanent when a considerable excess of oleic acid was used, or even when no excess was used and the required weight was made up with lard or other fatty substance, in consequence of the formation of mercurous oxide, which did not seem to be confined to the surface, but gradually penetrated the mass of the ointment. The writer then determined to use cosmoline as the diluent or vehicle, and was pleased to find that it answered the purpose well, as some of the ointment which has been made over a year does not show any sign of decomposition, and only a slight change in color, having become somewhat darker then when first made. Cosmoline seems to have been first employed for this purpose by the physicians and pharmacists of Washington, D. C., as published in their book of "Formulæ," 1875, page 42.

Ointment of oleate of mercury, made with 10 per cent. of mercuric oxide:

Take of	Mercuric oxide,	1 ounce, troy.
	Nitric acid,	6 fluid drachms.
	Liquor sodæ, U. S. P.,	6 fluid ounces.
	Oleic acid,	2½ ounces, troy.
	Cosmoline,	A sufficient quantity.
	Distilled water,	A sufficient quantity.

Dissolve the mercuric oxide in the nitric acid; dilute the solution with a pint of distilled water and filter it into a tared dish

containing the liquor sodæ, stirring constantly. Allow the precipitated oxide to subside, and decant the liquid portion. Wash the precipitate with distilled water and decant as before, until the sodium nitrate and the free nitric acid is removed.

Place the dish containing the moist precipitate on a water-bath, apply heat, and add gradually the oleic acid, stirring constantly, until the combination is effected, and all trace of mercuric oxide has disappeared. It may be found necessary to add a small portion of boiling water from time to time until this result is accomplished, but all excess of moisture should be removed by decantation and careful evaporation before the cosmoline is added. Lastly, add a sufficient quantity of cosmoline to make the completed product weigh ten troy ounces.

Ointment of oleate of aconitia, containing 1 per cent. of aconitia:

Take of	Aconitia,	5 grains.
	Alcohol,	60 minims.
	Oleic acid,	30 minims.
	Cosmoline,	465 grains.

Place the aconitia in a capsule with the alcohol, and when it is dissolved add the oleic acid. Heat gently on a water-bath until the alcohol is evaporated, then add the cosmoline and mix thoroughly.

Ointment of oleate of atropia, containing 1 per cent. of atropia:

Take of	Atropia,	5 grains.
	Alcohol,	60 minims.
	Oleic acid,	30 grains.
	Cosmoline,	465 grains.

Proceed in the manner directed for ointment of oleate of aconitia.

Ointment of oleate of quinia, containing 25 per cent. of quinia:

Take of	Quinia sulphate, commercial,	145 grains.
	Water of ammonia, 20°,	2 fluid drachms, or a sufficient quantity.
	Distilled water,	A sufficient quantity.
	Oleic acid,	240 grains.
	Cosmoline,	A sufficient quantity.

Dissolve the quinia sulphate in 4 fluid ounces of distilled water with a sufficient quantity of diluted sulphuric acid. Mix the water of ammonia with 4 fluid ounces of distilled water and pour it into the solution of quinia, stirring at the same time. Wash the magma on a muslin filter carefully with distilled water, and transfer it to a tared capsule; place the capsule on a water-bath and add the

oleic acid. Heat carefully until the combination is effected; pour off the water which separates, and add a sufficient quantity of cosmoline to make the ointment weigh 432 grains when completed.

Ointment of oleate of mercury and morphia, containing 6 per cent. of mercuric oxide and 2 per cent. of morphia:

Take of	Ointment of oleate of mercury, 10 per cent,	300 grains.
	Cosmoline, ...	135 grains.
	Oleic acid, ...	60 grains.
	Morphia, ...	10 grains.

Dissolve the morphia in the oleic acid with aid of heat on a water-bath; then add the ointment of oleate of mercury and then cosmoline; mix thoroughly.

Ointment of oleate of morphia, containing 5 per cent. of morphia:

Take of	Morphia, ...	25 grains.
	Oleic acid, ...	150 grains.
	Cosmoline, ...	325 grains.

Dissolve the morphia in the oleic acid with the aid of heat on a water-bath, then add the cosmoline and mix thoroughly.

The oleic acid used in the foregoing experiments was from the laboratory of Dr. E. R. Squibb.

With respect to the second part of Query 15, the writer begs leave to say that he has not investigated the subject for want of time, and requests that it may be continued to him for another year.

August, 1877.

ON CANTHARIDAL COLLODION.

BY JOSEPH ROBERTS, BALTIMORE, MD.

QUERY 10.—The present formula for cantharidal collodion contains but a very small quantity of alcohol, rendering the pyroxylin very difficult of solution. Cannot the quantity of alcohol be increased with advantage without materially interfering with the character of the film?

FINDING upon inquiry amongst our manufacturing chemists that in making cantharidal collodion they did not except so far as to make the preparation of officinal strength follow the formula of our Pharmacopœia; finding further that this preparation, as found upon the market, is generally satisfactory, both as a vesicant and in the character of the film it forms, I have not thought it nec-

essary to go into any exhaustive experiments to prove a generally admitted fact. The fact is that the menstruum directed in the officinal formula for cantharidal collodion may be improved by increasing the quantity of alcohol therein prescribed, and I so reply to Query 10, and here append the formula for cantharidal collodion of one of our best manufacturing chemists, one whose preparations always command the confidence of physicians.

Cantharidal Collodion.

Powdered cantharides, ...	8 ounces, troy.
Stronger ether, ...	A sufficient quantity.
" alcohol, ...	" "
Collodion cotton (pyroxylin), . .	144 grains.

Mix the cantharides with 4 fluid ounces of the stronger alcohol, pack it in a funnel for displacement, add 4 fluid ounces of stronger ether, and cover the funnel with a plate of glass, to fit tightly and prevent evaporation, having previously inserted a cork in the lower end of the funnel. Let it stand twelve hours, and then displace with stronger alcohol and stronger ether, in equal proportions, until 15 fluid ounces have passed, which reserve. Then displace with some of the same menstruum until 4 fluid ounces have passed, which evaporate to 1 fluid ounce, and add to the first 15 ounces. Lastly, add the pyroxylin, and agitate occasionally until it is dissolved.

EAU DE COLOGNE.

BY WILLIAM SAUNDERS, LONDON, ONTARIO, CANADA.

Since the publication of my paper on perfumery, read at the last meeting of the Association in Philadelphia, I have been applied to from many quarters for a formula for a really good cologne. I think it is universally conceded that the brand of imported Farina cologne, known under the designation of "Jülichs Platz," is the best of any in the market, always commands the highest price, finds a ready sale, and invariably gives satisfaction. Whenever we find an article of this sort in constant demand, and that demand sustained during a long series of years over nearly all the civilized world, without much effort in the way of advertising, we may, I think, fairly conclude that it is one which meets a want generally felt, and meets it in an agreeable and attractive manner.

This cologne is highly fragrant and very refreshing, agreeable alike to the invalid and the healthy, and has none of the cloying sweetness which characterizes many perfumes. Knowing of no higher standard, I have endeavored to devise a formula for a cologne which shall be as nearly as possible a fac simile in quality of this very desirable brand, and in this I have succeeded to my entire satisfaction, and herewith submit samples of both preparations.

The formula is as follows, all the quantities being fluid measure:

Oil neroli opt.,	5 drachms, 20 minims.
" bergamot,	1 ounce.
" rosemary,	1 drachm, 20 minims.
Ext. jasmin,	1 ounce.
Pure alcohol,	6 pints.
Water,	2 pints.

The mixture is slightly milky, but becomes quite clear when filtered if a little powdered magnesia is added to the filter. With best oil of neroli at $3.25 per ounce, and spirit at $1.75 the wine gallon, this fine quality of cologne will cost $4.12 per gallon, or 52 cents per pint to prepare. The present wholesale price of the four-ounce imported colognes of the brand referred to is, in Canada, $4.50 per dozen, which is equal to $1.50 per pint, or nearly three times the price of that prepared from the formula submitted.

To those who desire a cheaper perfume, the writer would suggest the diluting of this cologne. If reduced to half the strength by the addition of a mixture of three parts of pure spirit to one of water, the cost would be lowered to 35 cents per pint. A sample reduced in this proportion is also submitted for your inspection.

I may here repeat, what I have already urged in my former paper on Perfumery, that success is dependent entirely on the quality of the articles used. If the neroli and other oils are of first quality, and the spirit pure, there will be no difficulty whatever in making cologne equal to the sample presented.

When we consider the highly refreshing character of this perfume, and in how many instances its use in the sick-room would add to the comforts of the invalid, it seems to the writer desirable that a formula for an article of this sort should be adopted and incorporated in the next revision of the Pharmacopœia, so that there might be a standard preparation of this class which physicians could prescribe with confidence. It would in many instances prove a desirable addition to lotions and other preparations for

external use, without in any way impairing their efficiency. Should such a preparation be thought worthy of a place in the U. S. national standard, this formula is confidently suggested as one which would in all probability give entire satisfaction, and if adopted it should be known by a different name, to prevent its substitution by the many indifferent compounds now sold under the name of cologne water. Possibly *spiritus neroli compositus* might be regarded as a suitable name.

II. MATERIA MEDICA.

ON THE RESIN OF THE RHIZOME OF PODOPHYLLUM PELTATUM, LINN.*

BY FREDERICK B. POWER.

Among the many valuable medicinal plants indigenous to North America there are few which have received more constant attention from medical practitioners amid the never-ceasing evolutions of medical and pharmacal science, or which have more often been made the subject of chemical investigation than the podophyllum, or the resinous principle yielded by its rhizome.

For over half a century, and from the time of the publication of the first U. S. Pharmacopœia until the present, it has maintained a place in that standard, and the resinous principle, the so-called podophyllin (an unfortunate misnomer), may still be classed among the most popular American medicinal remedies.

To attempt to enumerate all the investigations upon this subject, which are so profusely scattered throughout the literature of pharmacy and medicine, with the frequent endeavor to determine the constituents of the resin, would be quite impossible within the limits of this paper. The writer must therefore confine himself to those points which have a more direct bearing upon the results of the present investigation.

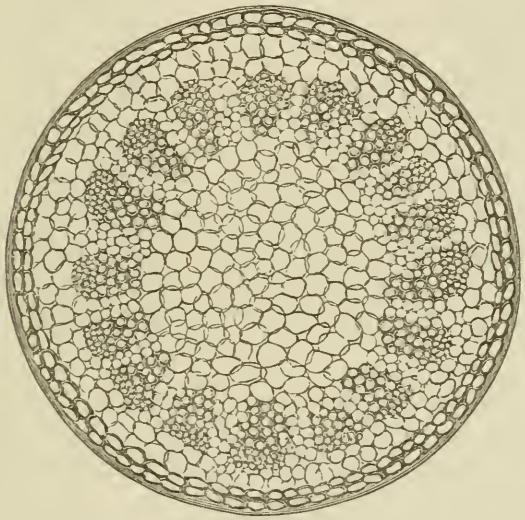
The botanical descriptions of this plant, as also the physiological characters of the resin, are so well known, and so readily accessible in all works treating specially upon these subjects, that their introduction here would offer little of special interest. A brief synopsis

* Read at the Fifth Session.

of the microscopical structure of the rhizome, however, would seem to merit a passing notice, and may also serve to explain the accompanying drawings.

The microscopical structure is so exceedingly simple that but comparatively little remains to be added by the writer to the excellent description given by Prof. Flückiger.* Upon a cross section, Fig. 58, the vascular bundles, varying from sixteen to twenty

Fig. 58.



Podophyllum.—Cross section of rhizome, highly magnified.

or more in number, are arranged in a circle, showing the usual form of vessels inside of the cambial tissue, together with narrow-tissued, wedge or crescent-shaped liber bundles or sieve-tubes projecting slightly into the cortical layer. The cortical layer consists of a double row of thickened cells, with yellowish-brown walls, which, together with the yellow-colored vascular bundles, form the chief depository of the resin.

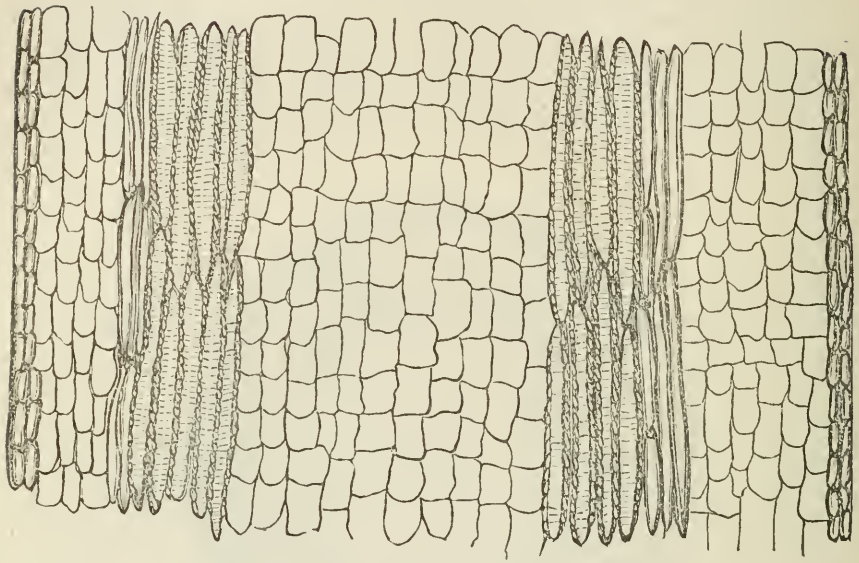
Upon a longtitudinal section, Fig. 59, the vascular bundles have the form of spiral and scalariform vessels, with sieve-tubes in the cambial tissue.

The radicles display, upon a cross section, Fig. 60, a single group

* Pharmacographia, page 36.

of scattered vascular bundles, filling the central tissue. The cortical portion consists of a single row of thickened cells, with

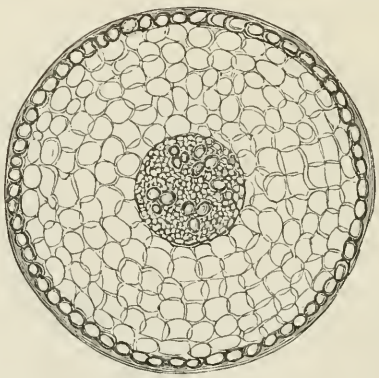
FIG. 59.



Podophyllum.—Longitudinal section of rhizome, highly magnified.

yellowish-brown walls. The parenchymatous tissue of the rhizome and also of the radicles consist of large, thin-walled, isodiametric

FIG. 60.



Podophyllum.—Cross section of rootlet, highly magnified.

cells, loaded with simple starch-granules, the starch having been omitted in the drawings for the purpose of clearness. The colora-

tion with ferric chloride, however, the writer believes to be due to the acid resin, rather than to tannic matter.*

Chemical Investigation.

In glancing over the chemical literature of this subject, many discrepancies present themselves, which are quite surprising, and offer much interest in connection with the results obtained by the present analysis, from the fact that for so long a period they should have escaped attention.

The materials used in the experiments here detailed were the entire selected rhizomes, powdered under the writer's supervision, and the resin prepared by himself therefrom, so that no question of doubt might arise as to their authenticity or purity.

One and a half kilogram of the rhizomes were subjected to distillation with water, by which a small amount of a suspended and floating flocculent substance was obtained in the distillate, of strongly diffusive, somewhat aromatic odor, which was recognized as volatile, fatty acid; although yielded in such small amount that its melting-point could not be ascertained or its characters further investigated, it is quite probable that it may be found to consist of myristic acid, which is so widely extended in the vegetable kingdom. The same substance was also obtained in quite well-defined crystals when the rhizomes were exhausted by boiling alcohol and the concentrated alcoholic liquid exposed for some time to the winter temperature. It is also evident that to this principle the peculiar and strongly diffusive odor of the rhizomes is due, observable during the preparation of the officinal resin. According to Mr. John R. Lewis,† the rhizome contains traces of volatile oil, which the writer cannot confirm from the above experiment, and which is not rendered evident by an examination of the microscopical structure of the rhizome.

In preparing the resin 3 kilograms, 2½ hectograms, of the coarsely powdered rhizomes were exhausted by subjecting them twice to the action of boiling alcohol in a still, and finally subjecting the exhausted rhizomes to strong pressure. The liquids were then mixed and concentrated by distilling off the alcohol. The concentrated alcoholic liquid was then poured into a large volume of water, acidulated with sulphuric acid, this acid having been em-

* Pharmacographia, p. 36.

† Amer. Journ. of Pharm., vol. xix, p. 165.

ployed in preference to hydrochloric acid, which is used in the officinal process for the preparation of the resin, in order to more readily effect its removal and thus facilitate the examination of the substance which would be held in solution.

The resin thus precipitated was collected, washed, redissolved in alcohol, and again precipitated by acidulated water; this operation was repeated a third time in order to obtain a product as pure as possible.

The resin thus obtained, after thorough washing with distilled water, was dried first upon a porous tile at the summer temperature, and finally over sulphuric acid. The yield of the very light-colored purified product was 70 grams, or about 2.15 per cent.

The aqueous acid liquid obtained by the first precipitation of the resin was directly treated with barium carbonate, before subjecting to evaporation, in order that no decomposition should occur.

The filtered liquid thus obtained was of a bright reddish-brown color, and possessed a bitter taste. It is colored intensely yellow by alkalies, greenish by ferric chloride, precipitated by cupric sulphate, reduces silver salts, and yields, upon concentration, a dense yellow precipitate with normal plumbic acetate, freely soluble in acetic acid. It is, however, not precipitated by solution of gelatin, which proves the coloration with ferric salts not to be due to tannic matter, and does not yield the characteristic reactions of gallic acid, which is stated by Mr. John R. Lewis* to be a constituent of the rhizome, since it does not give the reaction with ferrous sulphate and alkalies, furnishes no crystals of that body, nor does it give the reaction of gallic acid with acid vanadate of ammonium, the salt having the composition $(NH_4)_2Vd_4O_{11}+4H_2O$, which the writer found to give as well with gallic as with tannic acid the well-known reaction of the latter, similar to that produced by ferric salts. The coloration with ferric salts as well as the other reactions enumerated will be seen to correspond quite closely to quercitrin, but the attempts to obtain a crystalline body therefrom were unsuccessful. It differs, however, from quercitrin by its greater solubility in water. In this liquid no precipitate was produced by mercurio-potassic iodide, nor by a solution of iodine in potassic iodide; it also does not give the characteristic reaction of berberina, according to Klunge's elegant and delicate applica-

* Amer. Journ. of Pharm., vol. xix, p. 165.

tion of the chlorine test* for this alkaloid, and which will detect exceedingly small amounts ; in this instance but a faint evanescent coloration being produced upon the addition of chlorine water to the acidulated solution, which in comparison with parallel experiments made with solutions containing mere traces of the alkaloid must lead to the acceptance of the surprising fact that the rhizome of Podophyllum peltatum contains *no* berberina, and that the coloring-matter is *a constituent of the resin itself;* a fact all the more surprising when we consider that for a period of nearly half a century the supposed presence of this alkaloid in the rhizome should have become so universally accepted, and from time to time confirmed, without ever having been isolated from it.

It was first in 1831 that Mr. William Hodgson, Jr., read before the Philadelphia College of Pharmacy, a paper "On the Bitter Principle of Podophyllum Peltatum,"† and at which time he extracted a principle, "by boiling the rhizomes with water containing quicklime, precipitating the lime by zinc sulphate, evaporating the clear liquid until it acquired the consistence of an extract, treating with cold alcohol of sp. gr. 0.817, filtering the alcoholic solution, evaporating to dryness, and boiling the residue in distilled water. On cooling a semi-crystalline substance was obtained, which upon washing with water and drying was obtained in brown scales of considerable lustre." The behavior of this substance towards some reagents is then given by Hodgson, which, in comparison with the investigations of the writer, could have been no other substance than the resin itself, which readily combines even with weak alkalies, forming compounds quite readily soluble in water, and which, as separated by him by this method in thin scales, may assume upon superficial examination a semi-crystalline appearance, but examined under the microscope is seen to be destitute of any geometrical angles, and must therefore be considered amorphous.

The comparative inactivity of the product as thus obtained is readily explicable in view of the more recently observed effect of alkalies upon the resin in diminishing its activity.‡ The olive or green coloration of the substance, changing to purple, observed by Hodgson by sulphuric acid, may have been due to an impurity in

* Proc. Am. Pharm. Asso., 1875, p. 426.

† Journ. of the Phila. College of Pharmacy, 1832, vol. iii, pp. 273–275.

‡ Cadbury, Amer. Jour. of Pharmacy, July, 1858, and Credner, Inaug. Dissertation, Giessen, June, 1869.

the acid employed, such as the presence of nitrous compounds, the pure resin producing with sulphuric acid a yellow or greenish-yellow coloration. With this single exception, the reactions correspond with those of the pure resin.

As the paper next worthy of review, may be considered that of Prof. F. F. Mayer,* "Note on the Proximate Principles of some Berberidaceæ and Ranunculaceæ," where the author states, "that from the few data given by Hodgson, the bitter principle described by him could only have been the yellow alkaloid of that family." Apparently supported alone by this supposition, the author makes the positive statement that "the rhizome contains both berberina and a colorless alkaloid," also that "the alkaloid may be precipitated by lead or by acids," and "that the colorless alkaloid is contained in that portion of the resin which is insoluble in ether," all of which the writer, guided by the results of a previous† and the present investigation, can by no means confirm, and must radically refute. As regards the occurrence of saponin, which is also stated by Prof. Mayer‡ to be present in the rhizome, the writer would express a serious doubt, having not succeeded in isolating it, and is inclined to believe the frothing and irritating properties formerly attributed to this substance to be due to the acid resin, which also in chemical behavior has some analogies to saponin.

To return to the examination of the aqueous liquid obtained by the precipitation of the resin; it was first treated with normal plumbic acetate, the dense yellow precipitate collected and washed, suspended in water, and decomposed by hydrosulphuric acid. The resulting liquid, when evaporated, forms a dark-brown hygroscopic mass, which is not again so readily soluble in water, some resinous matter separating, which is more freely dissolved by alcohol, and precipitated by a small amount of water. The filtrate from the precipitate caused by the normal plumbic acetate forms, upon the addition of ammonia water, a dense precipitate of a bright-yellow color; an excess of lead remaining in the filtrate from the first lead precipitate, a basic lead salt was thus formed. This precipitate was also decomposed by hydrosulphuric acid, and left upon evaporation a similar brown hygroscopic mass to that obtained from the normal lead precipitate. Both being soluble in an excess of

* Amer. Journ. Pharm , March, 1863, vol. xxxv, p. 98.

† Power, Amer. Journ. Pharm., May, 1874, pp. 227–231.

‡ Amer. Journ. Pharm., March, 1863, vol. xxxv, p. 98.

acetic acid, and corresponding quite closely in their behavior toward reagents, the two precipitates were considered to be identical. The liquid remaining after precipitation by the lead salts was freed from lead by hydrosulphuric acid, and formed upon evaporation a dark-colored viscid liquid. Upon digestion with ether and petroleum benzin, but a trace of amorphous resinous matter was extracted by the former. The liquid is not affected by alkalies or ferric chloride, and consists principally of sugar. The liquids obtained by the decomposition of the lead precipitates have the property of frothing quite strongly upon agitation, which is likewise produced by a solution of impure quercitrin, but not to the same extent as a solution of saponin, and cannot therefore be regarded as confirming the presence of the latter. The solution is colored intensely yellow by alkalies and alkaline carbonates, olive green by ferric chloride, reduces silver and mercurous salts and cupric oxide in alkaline solution, colored pale green by cupric sulphate, and the precipitate produced by lead salts is freely soluble in acetic acid, thus having many properties in common with quercitrin, but is acid and amorphous, and corresponds also with the acid resin as obtained from the original resin, both in its behavior toward reagents and its powerful purgative action.

By digesting this substance with ether a resinous, amorphous, yellowish-brown substance was removed, which, upon treating with boiling distilled water, became partially dissolved, forming upon cooling a turbid solution, and depositing a small amount of flocculent light-colored resin. This liquid, upon spontaneous evaporation, deposited some beautiful colorless needle-shaped crystals, mixed with amorphous matter, and the aqueous solution gives with ferric chloride a blue coloration, quickly changing to a bright green, and upon the addition of a dilute solution of sodic hydrate, changes first to purple and finally a blood-red color, thus highly characteristic of protocatechuic acid. Although a sufficient amount of the pure substance could not be obtained for a more complete examination, it would seem quite probable that this acid exists ready formed, which would indeed be very interesting, for although frequently yielded by the decomposition of resinous substances, it would be the first instance of its observed pre-existence.

Examination of the Purified Resin.

The purified resin, as obtained by the third precipitation with water, was found to be soluble in twice its weight of strong alco-

hol, and although the resin itself is very light in color, it has the property of forming exceedingly dark-colored solutions, and upon being made so dilute as to contain but 10 per cent. of resin, the liquid is still too deeply colored to admit of a parallel optical comparison with jalap resin in regard to the extent of deviation of the plane of polarization of a ray of light.

All attempts, also, to obtain a more colorless product by means of animal charcoal and dialysis were unsuccessful, and apparently impossible, since the coloring principle seems not to be due to a foreign body, but to be an integral constituent of the resin itself.

An alcoholic solution of the resin, when saturated with the vapor of bromine, becomes at first colored of a deep red, soon changing to a lighter blood-red color, and gradually, upon saturation, passing into deep golden-yellow. The solution leaves, upon evaporation, an amorphous residue, and is precipitated by water as a soft resinous mass. The oxidation product thus formed is almost entirely soluble in ether, sp. gr. 0.720, leaving again, upon evaporation, a brown amorphous residue. Upon dissolving this in ammonia water, heating to expel excess of ammonia, a precipitate was obtained with silver nitrate, which would indicate the formation of a substitution product.

One gram of the purified resin was carried into fused caustic soda in a silver capsule, and kept in a state of fusion for a few moments. The resulting mass was dissolved in water, and neutralized by sulphuric acid, when the odor of volatile acids became apparent. The solution, after the removal of the sodium sulphate, was treated with ether, which, upon evaporation, left a small amount of nearly odorless acicular crystals, having a strongly acid reaction, and upon solution in water correspond to the test for protocatechuic acid, but the resin by this decomposition yields no resorcin.

One gram of resin was dissolved in a dilute solution of sodium hydrate, and subjected to the slow action of nascent hydrogen, by allowing it to remain in contact with sodium amalgam for several days. The liquid became somewhat lighter in color, but upon supersaturation with hydrochloric acid, in order to again precipitate the resin, it appeared to have undergone no further change than that produced by precipitating the resin by means of an acid from an alkaline solution, and apparently forms no hydro-compound by this treatment.

As an attempt to separate the constituents of the resin, ten grams

were dissolved in ammoniacal water, to which solution was added an alcoholic solution of plumbic acetate, in order to form a basic salt in alcoholic solution, and thus avoid the possibility of any mechanical precipitation by the use of aqueous liquids. The precipitate thus obtained was of a deep orange color, and after decomposition by hydrosulphuric acid in suspension with alcohol, and removal of the lead sulphide, a liquid of a deep reddish-yellow color was obtained, becoming turbid upon the addition of water, and by spontaneous evaporation leaves yellowish-brown flakes of amorphous resin, corresponding, in consideration of loss, to about 50 per cent. of the original resin. The alcoholic filtrate from the lead precipitate was freed from lead, when a liquid of a pale-yellow color was obtained, forming a milky-white turbidity upon the addition of water, and left upon evaporation an amorphous brown resin, accompanied by some fatty matter which prevented its being obtained perfectly dry. Thinking it possible that the precipitate caused by the basic lead acetate might not be a simple body, ten grams of resin were again dissolved in alcohol, and first precipitated by an alcoholic solution of normal lead acetate, forming an abundant orange-yellow precipitate, which was collected and decomposed as before in suspension with alcohol. The filtrate from this precipitate, which contained an excess of the lead salt, furnished again, upon the addition of ammoniacal alcohol to form a basic salt, a dense precipitate of orange-yellow color, which was separately collected and decomposed by hydrosulphuric acid.

These two liquids furnished upon evaporation brown, amorphous products, which in their behavior toward reagents were apparently identical, the precipitate caused upon the addition of ammoniacal alcohol to the filtrate from the normal lead precipitate being easily explicable in view of the ready solubility of the latter in acetic acid.

The filtrate from these two lead precipitates furnishes again a neutral resin, accompanied by some fatty matter. This acid resin, as obtained by precipitation with lead salts, has the following characters, many of which are common to the original purified resin: It is colored intensely yellow by concentrated sulphuric acid, and by bringing in a trace of nitric acid, assumes a purplish color, quickly changing to brown; very faintly colored by hydrochloric acid, colored deep reddish-brown by nitric acid, and intensely yellow by alkalies and alkaline carbonates, the color being destroyed upon the addition of an acid.

The alcoholic solution is colored dull green by ferric chloride. The solution in commercial alcohol is entirely precipitated by an alcoholic solution of normal lead acetate, and the precipitate is freely soluble in acetic acid.

When treated with boiling water it partially dissolves, and the aqueous solution is colored green by cupric sulphate, and readily reduces cupric oxide in alkaline solution, reactions also produced by an aqueous solution of the original resin.

By ether, sp. grav. 0.720, it may be separated into a portion soluble and insoluble in that liquid, which would indicate, together with the difference in the physical characters of lead precipitate by fractional precipitation, that this acid resin is again separable into at least two bodies.

The neutral resin, which is not precipitated by lead salts, in its behavior toward the above-mentioned reagents has none of the properties which characterize the acid resin, but by treatment with ether may be resolved into a portion soluble and insoluble in that liquid.

It was impossible for the writer to execute physiological experiments with all the substances and decomposition products of the resin obtained during this investigation. In order, however, to ascertain the relative activity of the acid and neutral resin, two centigrams of each were taken at proper intervals, but no appreciable difference in their action was observed, both having a mild cathartic action, from which fact the writer is neither able to confirm the theory of Prof. Buchheim,* that the acid resin which constitutes so large a portion of the officinal resin is inactive, nor that the acid resin, which he considers the anhydrid of the active resin, is formed by the action of alkalies, and by the extraction and evaporation of its solution, but that it *pre-exists* in the rhizome, and which view is supported by the fact that the rhizome itself, when touched upon a cross section with alkalies, ferric chloride, or concentrated sulphuric acid, produces those colorations which are alone characteristic of the *acid* resin, and are not produced by the neutral resin.

Prof. J. M. Maisch,† in attempting some years ago to determine the amount of berberina in the resin as prepared by the officinal

* Vierteljahrschrift Pharm., 1873, No. 3, pp. 333–336, and Proc. Am. Pharm. Ass., 1874, vol. xxii, p. 125.

† Am. Journ. Pharm., 1874, vol. xlvi, No. 5, pp. 231, 282.

process, was the first to notice the remarkable extent of the solubility of the resin in boiling water, he having obtained a substance by this means which was at first supposed to be the native berberina salt, but found it to be free from that alkaloid. It seems, however, at that time not to have been recognized that the rhizome of podophyllum is *absolutely free* from berberina.

To ascertain the extent of the solubility of the resin in boiling water, one gram of the resin was placed in a flask with distilled water upon the water-bath; the resin soon softens to a brownish mass, while the water assumes a bright amber color, perfectly transparent while hot, but becoming turbid upon cooling, and gradually depositing portions of flocculent yellowish resin; the water was thus successively decanted and renewed with fresh portions, the operation being continued for many days until the water became no longer appreciably colored. The writer succeeded in dissolving 80 per cent. of the purified resin by this treatment, the undissolved portion being, when dry, of a very dark-brown color, and is but partially soluble in ether, sp. grav. 0.720, which proves the correctness of Prof. Maisch's supposition, and that the active portion of the officinal resin is almost entirely soluble in hot water.

Five grams of resin were subjected to dry distillation, which, in addition to the usual gaseous products, furnished a small amount of condensed liquid of a dark-brown color; the distillate having a slightly aromatic, in addition to the pyroligneous odor. In addition to acetic acid a phenol is thus produced, giving a violet color with ferric chloride, but seems not to be identical with ordinary phenol, in not producing with the vapor of bromine the tribromphenol. A substance is also simultaneously formed which, in acid solution, reduces silver salts, cupric oxide in alkaline solution, and liberates iodine from iodic acid, being thus allied to pyrocatechin or pyrogallol, but apparently identical with neither.

The hydrocarbons which are doubtless formed by this decomposition, would require the destruction of an exceedingly large amount of material for their isolation and examination.

No umbelliferon or crystallized product was obtained by this decomposition. Another attempt was made to obtain umbelliferon by heating a portion of resin with hydrochloric acid, sp. grav. 1.12, for several hours upon the water-bath. A bright blood-red liquid was thus obtained, but a small amount of resin passing into solution. This liquid, upon shaking with ether, left, upon evaporation, a slight amorphous, resinous residue, producing, upon the addition

of ammonia water, a beautiful violet color, quickly changing to brown, but the solution shows no fluorescence, and no umbelliferon is thus formed.

A portion of resin was then dissolved in absolute alcohol, and the solution saturated with dry hydrochloric acid gas, becoming somewhat darker in color. It was then precipitated by water, when the resin assumed a dull reddish color, the aqueous acid liquid being also of a bright red color, similar to that produced by heating the resin with hydrochloric acid upon the water-bath. This aqueous liquid contains also no umbelliferon, proving this body not to be produced by the decomposition of the resin. The precipitated reddish-brown resin is again freely soluble in alcohol, becoming turbid upon the addition of water, and gives, with ammonia water, a green coloration in reflected light.

Of the purified officinal resin, 82 per cent. was found to be soluble in ether of sp. grav. 0.720, at 22° C.

The resin is entirely soluble in ammonia water, sp. grav. 0.96, forming an intensely yellow solution, becoming darker upon exposure to the air, and in concentrated solution soon assumes a gelatinous character. The ammoniacal solution may be diluted to any extent with water, without precipitation. The resin in alkaline solution is not entirely precipitated upon supersaturation with an acid, a small amount always remaining in aqueous solution. An attempt was made to ascertain the nature of the change produced by the action of alkalies upon the resin, by dissolving it in barium hydrate, and precipitating the barium by carbonic acid gas, but it was observed that the entire amount of barium could not be precipitated by this means, a portion still remaining in aqueous solution combined with the resin. It has, however, been previously shown that alkalies have the property of almost completely destroying the activity of the resin.

All attempts to obtain crystalline compounds of the resin with alkalies were also unsuccessful, amorphous products being always obtained.

The purified resin when burned leaves a large amount of charcoal, and when strongly heated upon platinum foil, leaves a small amount of white ash, consisting chiefly of sodium and potassium salts, which are difficult to remove, owing to the acid character of the resin. It was also found that colorless jalap resin leaves, upon ignition, a slight residue, which is much more considerable in the unpurified resin of Ipomœa Orizabensis. The purified officinal

resin, dried over sulphuric acid, when heated upon the surface of mercury becomes soft at 120° C., 248° F., and melts perfectly at about 124° C., 255° F.

The resin, when treated with nitric acid, appears to furnish as final decomposition products, oxalic acid and an amorphous highly colored yellow substance, freely soluble in water.

The purified resin was finally subjected to elementary analysis. The resin dried at 100° C. became so dark in color, having an almost charred appearance, probably having suffered oxidation, was considered unsuitable for this purpose.

0.256 gram of resin dried over sulphuric acid until it no longer lost weight, furnished, upon combustion with oxide of copper,

0.607 gram $CO_2 = 0.16554$ C. $= 64.66$ per cent. C.
0.142 " $H_2O = 0.01577$ H. $= 6.16$ per cent. H.

To attempt to deduce an empirical formula from these results would be of little value from the complicated character of the resin, and inability to form any crystalline salts or definite chemical compounds.

To briefly summarize the results of these experiments, it may be finally observed that podophyllum contains no alkaloid, and that the yellow coloring principle heretofore supposed to be due to berberina is due to the resin, and to that portion of it which is of acid character and which may with some degree of propriety receive the previously applied name of podophyllinic acid, which has also in chemical behavior many analogies to quercitrin.

The question regarding the apparent pre-existence of protocatechuic acid in the rhizome, the writer must reserve for future investigation, and would also herewith acknowledge his indebtedness to Prof. F. A. Flückiger for the interest and valuable aid extended by him throughout the prosecution of this investigation, which the writer by no means considers complete, but may perhaps serve at least to show how large, interesting, and almost inexhaustible is the field of labor which is opened by our indigenous Materia Medica.

STRASSBURG, ALSACE, GERMANY, August 9th, 1877.

THE ROOT OF EPILOBIUM ANGUSTIFOLIUM.*

BY C. J. BIDDLE, PHILADELPHIA.

QUERY 57.—The root of Epilobium angustifolium is said to have been used with success in the treatment of aphthæ. Is this opinion well founded, and if so, to what principle in the root is its remedial action to be attributed?

THE Epilobium angustifolium, L., E. spicatum, Lam., is a common plant growing very abundantly in many parts of the United States, north of the 39° of north latitude, and in British America, as far north as Behring's Straits; it is also indigenous to the northern portions of Europe and Asia.

It has a simple erect stem, often branched above, from four (4) to six (6) feet high, leaves scattered, lanceolate, subentire, with a marginal vein, sessile, smooth, acuminate, with pellucid veins; flowers in a long terminal spike, numerous and showy, all parts colored; petals deep lilac-purple; they appear in July and August. Seeds numerous, in linear four-cornered and four-valved capsules, to which are attached long silky hairs.

The root penetrates the soil quite deep, and is much branched; it is from three (3) to six (6) lines thick, and is covered with quite a thick bark; the ligneous portion is very tough and fibrous.

As to the therapeutic value of the root, as a remedy for the cure of aphthæ, there is no doubt.

It has been used by Dr. H. A. Smith, resident physician of the Philadelphia Hospital, with success.

The form in which it was used was the infusion, made one (1) part of the contused root to sixteen (16) parts of boiling water.

A qualitative analysis of the root was attempted, but owing to the difficulty of securing a large quantity, I was unable to treat it as thoroughly as the subject requires.

The dried contused root, when treated with water, either hot or cold, causes small white crystalline masses to separate, which appear under the microscope to be close bundles of needle-shaped crystals; these were separated mechanically, and on testing proved to be a calcium salt.

No preparation of the root when treated with Mayer's test for alkaloids showed evidence that one existed.

A saturated decoction treated with the precipitants mentioned

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* Read at the Third Session.

in the "U. S. Dispensatory," under Gallæ, page 430, produced very similar results. The root contains large quantities of tannin, gum, and mucilage; it also contains starch, sugar, resin, gallic acid, extractive, etc.

The tannic acid is the kind which produces a bluish black color with ferric salts. Its remedial action, I do not think, is to be attributed to any *one* principle in the root; in my opinion it is in its combined demulcent and astringent properties.

For the cure of aphthæ, an infusion of any herb, having the above properties, is recommended, and as a never-failing remedy of easy access, we have the "mel sodii boratis" of the Pharmacopœia.

PHILADELPHIA, August, 1877.

VOLATILE OIL OF THE LEAVES OF MYRCIA ACRIS.*

BY PROF. GEORGE F. H. MARKOE, BOSTON, MASS.

DURING the past eight months I have been engaged in the distillation of bayberry leaf oil, or, as it is usually called, bay oil or oil of bay leaves.

About (7000) seven thousand pounds of the leaves were consigned to me, packed in bales that varied in weight from 150 to 375 pounds. The quality of the leaves varied very much, some being rich in oil, others yielded a very small per cent., not enough to pay for the trouble and expense of their distillation. Some of the bales were filled with large full-grown leaves, others with the leaves on the small branches or twigs on which they grew.

One lot, of two bales, about 500 pounds, was received in a green condition, just as the twigs had been pulled off from the trees, without drying. The leaves being tough and evergreen had not been at all injured.

The sample which is being passed among the members will serve to give an idea of the appearance of the leaves in a dry condition. They have no odor until they are crushed, when the strong fragrant odor characteristic of the familiar bay rum will be at once recognized. The leaves have an agreeable, pungent, spicy taste, and may be used as a flavor for soups, gravies, etc. The dried

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* Read at the Fourth Session.

unripe fruit or berries form a substitute for pimento or allspice; very few people would be able to tell the difference between the two, either by their appearance or by the taste.

The leaves received by me were mostly from the Island of St. Thomas. The apparatus used in distilling the oil from the leaves was a 200-gallon copper still, heated by steam, so arranged that either wet or dry steam could be used at pleasure.

From 200 to 300 pounds of leaves were used at each running of the still, and to work off this quantity required from eight to twelve hours, during which time from eighty to one hundred gallons of distillate would be obtained. The oil comes over in two portions. First a portion lighter than water, that comes over very rapidly, and then the heavy oil, that comes over very slowly and does not easily separate from the water, with which it forms a milky emulsion.

I will give the notes made of one of the runs with 200 pounds of the leaves. The distillate was collected in quantities of $2\frac{1}{2}$ gallons, and the oil carefully separated from each portion, and then I took the specific gravity of each of the portions of the light and of the heavy oils.

LIGHT OIL.

No. 1.	Specific gravity,	.870
No. 2.	" "	.930
No. 3.	" "	.946
No. 4.	" "	.964
No. 5.	" "	.982
No. 6.	" "	.990

The total yield of the light oil coming over in the first fifteen gallons of distillate, from which it promptly separated, leaving the water quite clear. The distillation was then continued to obtain the heavy oil until sixty-five gallons more of distillate were obtained. The oil was divided into three portions, and then the specific gravity of each portion was taken.

HEAVY OIL.

No. 1.	Specific gravity,	1.023
No. 2.	" "	1.035
No. 3.	" "	1.037

The oil when first distilled is colorless, but by exposure to the air quickly acquires a yellowish tint, which deepens into a rich

brown tint, and if the exposure is continued, the oil becomes quite dark in color just as does the oil of clove or the oil of pimento. The odor of the freshly distilled oil is rank, but in the course of from three to six months it becomes mellow and ripens into the agreeable fragrance so much liked in the best specimens of bay rum.

Wishing to study the light and the heavy bay oils I made the following experiment with a view of getting the two oils in a pure condition by a careful fractional distillation of the light and the heavy oils as obtained directly from the leaves.

1. Twenty (20) pounds of the crude heavy oil, which had been exposed to the air until it had acquired a deep-brown color, was put into a thirty-gallon jacketed steam still, together with twenty gallons of water. The distillation was begun very slowly, and the distillate collected in portions of $2\frac{1}{2}$ gallons. The first and second portions contained about four (4) pounds of light oil, then the water came over of a milk-white color, and on being allowed to stand the heavy oil subsided to the bottom of the bottles.

The distillation was very tedious, requiring twenty hours to get all the oil over. When the oil had separated from the water, the latter was returned to the still. Seventy-five gallons of distillate were required to complete the rectification. The twenty-six portions of heavy oil were divided into thirteen portions by mixing Nos. 1 and 2 together, 3 and 4, and so on through the series. The specific gravity of each portion was then taken, and is given in the following table, at 85° F., the temperature of the laboratory:

FRACTIONAL DISTILLATION OF HEAVY BAY OIL. SPECIFIC GRAVITY, TAKEN AT 85° F.

1.	Specific gravity,	. . . . .	1.025
2.	" "	. . . . .	1.030
3.	" "	. . . . .	1.036
4.	" "	. . . . .	1.040
5.	" "	. . . . .	1.045
6.	" "	. . . . .	1.045
7.	" "	. . . . .	1.047
8.	" "	. . . . .	1.048
9.	" "	. . . . .	1.048
10.	" "	. . . . .	1.048
11.	" "	. . . . .	1.048
12.	" "	. . . . .	1.042
13.	" "	. . . . .	1.035

The first eight portions were nearly colorless. No. 8 had a light-

straw color, 9 and 10 light brown, and 13 almost black, as may be seen by the specimen shown.

Nos. 8, 9, 10, 11, being all of the same specific gravity, were mixed together and taken to represent the pure heavy oil of bay. It had the following properties: colorless when first distilled, quickly acquiring a brown color by exposure to the air; the odor recalls that of clove; the taste hot, pungent, aromatic, very like that of oil of cloves; it reddens the skin and produces a hot, tingling sensation in the part to which it may be applied; the effect does not, however, last long. The oil is soluble in the 95 per cent. alcohol of the market in all proportions, also in ether and petroleum benzin. It is soluble in the officinal solutions of caustic potassa, forming after a short time a mass of crystals. I have not had time to push my investigations any further, but feel quite sure that the heavy oil of bay is identical with the eugenic acid common to the oil of clove and pimento.

The specific gravity was taken with much care, using a 500-gram flask in making the determinations at 77° F. and at 60° F.

Specific gravity of heavy oil of bay at 77° F.,	1.052
" " " " " 60° F.,	1.055

I next took ten (10) pounds of light oil of bay, as obtained from the leaves, having a sp. gr. of .945, and slowly redistilled it, reserving the first portion for examination.

This was a clear, limpid, colorless liquid, having a specific gravity of .829 at 77° F., and of .8356 at 60° F., perfectly soluble in strong alcohol, ether, benzin, and chloroform. It is, I presume, the characteristic terpene of bay oil, but I have not had time to examine it fully.

When the residue in the still was examined, about 4 ounces of a dark-colored, very thick body was obtained from the sides and bottom of the still. This I think is the resin that is formed by the oxidation of the eugenic acid of the oil of bay, and is the peculiar coloring-matter of the oil. It is carried over, to some extent, during the last part of the distillation.

I offer the above notes simply as preliminary to more extensive study of the subject, which I hope to be able to make, and the results of which I will gladly present to this Association at some future time.

August, 1877.

ON VERATRUM VIRIDE.*

BY CHARLES A. ROBBINS, PH.D.

QUERY 2.—As several conclusions have been reached in regard to the active principles of this drug, an accurate analysis is desired in order to definitely settle the subject.

THERE are few drugs which have been made the subject of more investigation with more contradictory results than Veratrum viride. In 1838, Worthington announced having obtained from this drug an alkaloid identical with veratria. In 1837, Richardson obtained similar results. (A. J. P., 1837, p. 209.) In 1862, Scattergood announced having obtained from it veratria, and a similar substance (which was insoluble in ether) and a resin, to which the action of this drug he supposed to be chiefly due. (A. J. P., 1863, p. 14.) In 1865, Bullock claimed that the alkaloid in question was not identical with veratria. He found in the root two principles, one soluble in ether, the other insoluble in ether. To these substances Wood gave the names respectively of veratroidia and viridia. (A. J. P., 1865, p. 321.) In 1872, Penquet decided that the veratroidia of Bullock was not identical with veratria, and first asserted the identity of Bullock's viridia with jervia. (Med. Rec., May, 1872, p. 121.) In 1874, Mitchell announced having obtained from Veratrum viride a base soluble in ether, distinct from veratria, which he called veratroidia, and confirmed Penquet's statement of the identity of viridia and jervia. (Proc. A. P. A., 1874, p. 436.) In 1876, Wormley announced that both Veratrum album and Veratrum viride contain an alkaloid, which, when pure, in its behavior with the mineral acids and with liquid precipitants fully responded to all the reactions for veratria. (A. J. P., 1876, p. 1.) In 1876, Bullock revised his former work, and announced, as conclusion, jervia to be the *only* alkaloid in Veratrum viride, the so-called veratroidia being a mixture of jervia with a light-colored resin, to which he attributes the poisonous action of the drug, modified perhaps in part by the jervia.

On account of the physiological properties and family character of Veratrum viride, it did not seem probable that its properties could depend either upon the alkaloid jervia or upon the resin noted by Bullock. As an active principle was known to exist, which to

* Read at the Fourth Session.

a certain extent was analogous in its properties to veratria, it seemed reasonable to suppose that this drug either contained that alkaloid or an alkaloid very similar in character.

Upon investigation, the rhizome of Veratrum viride was found to contain jervia in considerable quantity, also a crystalline substance soluble in ether, but which was not precipitated out of acid solution by a bicarbonate of the alkalies. Six pounds of the fluid extract was taken, and liquid brought to one-third original volume by distillation. This was mixed with two ounces of acetic acid (U. S. P.) and one pound of clean sand, and further evaporated to drive off any remaining alcohol, water being added from time to time to preserve the original volume. At this point a resin separated, and formed with the sand a tenacious mass, with which the sand was well incorporated.

The liquid part was decanted, the resin washed, washing concentrated, and added to the original liquor. To this liquor (which gave acid reaction) an excess of bicarbonate of sodium was added, causing a precipitate, which was found to consist of jervia, resin and coloring material. After four hours' standing, this precipitate was filtered off, sufficient caustic soda was added to filtrate, and the ensuing precipitate, after twelve hours' standing, was filtered off and dissolved in water acidulated with hydrochloric acid, and precipitated with caustic soda, and filtered. The alkaline filtrate was then shaken with absolute ether, to see if any alkaloid matter remained in it, the ether was decanted, and left upon evaporation a small residue which was dissolved in water acidulated with hydrochloric acid. Bicarbonate of sodium was then added, and the slight precipitate which it caused was filtered off, and the filtrate was added to other liquor. This liquor was rendered alkaline, then shaken with absolute ether (a still better way is to precipitate with slaked lime, dry the precipitate, and exhaust it by means of absolute ether), which was afterwards decanted, and left upon evaporation a more or less crystalline shellac-like residue, colorless in centre, light-yellow colored on edges (a small portion of this substance caused sneezing, similar to that caused by veratria).

This substance was supposed to be an active principle of the rhizome, but finding that it was not yet pure enough for purposes of investigation, it was dissolved in a small quantity of water acidulated with sulphuric acid. After twelve hours there separated a residue (sulphate of jervia), which was filtered out; to the filtrate bicarbonate of sodium was added, precipitate filtered out, filtrate

neutralized with caustic soda, and the precipitate, after twelve hours' standing, collected on a filter.

At this point was noticed a very unpleasant narcotic odor, and also that the substance on filter gave fumes with hydrochloric acid, showing probably the presence of a volatile base; the minuteness of quantity, however, prevented closer examination.

The precipitate on filter was now washed with about 20 c.c. of water, containing about 20 per cent. of alcohol. Undoubtedly in this way a portion of alkaloid was dissolved, but the method was deemed advisable in order to obtain substance on filter in greatest possible purity. The washings were acidulated with sulphuric acid, concentrated, and well shaken with ether, which ether was decanted off. The liquor was now rendered alkaline with caustic potassa, and was again shaken with ether; this ether was decanted, and left upon evaporation a colorless shellac-like mass, which possessed highly poisonous properties, and which failed to give any of the reactions for veratria. This substance will be referred to hereafter.

The substance on filter was dissolved in water and acetic acid; to this nitrate potassa in excess was added, causing no precipitate of nitrate of jervia, but causing resinous precipitate when the nitrate potassa is added in excess. After twelve hours' standing this was filtered off, to the filtrate was now added caustic soda, and the precipitate collected on filter. This was now dried and dissolved in absolute ether, which upon evaporation left a mass of colorless white crystals.

Physiological Properties.—A solution was made of the crystalline substance in water acidulated with acetic acid; 1 c.c. containing 0.01–10 m. of this was injected into a rabbit subcutaneously:

After five minutes' time, no perceptible change.

After ten minutes' time, slight uneasiness.

After twenty minutes' time, no noticeable change.

After thirty minutes' time, no noticeable change.

After forty minutes' time, no noticeable change.

After sixty minutes' time, no noticeable change.

Injected ten more.

After ten minutes, frothing at the mouth.

After fifteen minutes, vomiting and cramps, convulsions and death. Ten minims of a solution containing same strength of veratria were injected into a second rabbit of similar size, causing immediately violent convulsions and death.

Ten drops of solution of crystalline substance (0.01 in 1.0) were given to a pigeon by way of mouth, causing violent and continued coughing, but not causing death; probably none reached the stomach.

A series of experiments were conducted upon the smaller animals with this crystalline substance and with veratria, the results being similar to those obtained with rabbits. In the case of frogs, when the heart was exposed, the crystalline substance reduced the heart-pulsation from 60 normal pulse down to 38. Veratria reduced heart-beat to 24 pulsations per minute.

These results show that this substance possesses a similar action to veratria, though in a less degree.

Chemical Properties.—The Lassaigne test showed it to contain nitrogen. A solution of 1.2000 gave the following reaction:

Mayer's Solution.—Voluminous white precipitate, dissolves when heated and reprecipitates upon cooling.

Iodine in Iodide Potass Solution.—Brown precipitate, dissolves when heated and reprecipitates upon cooling.

Chloride of Platinum. — Yellow precipitate, dissolved when heated, not reprecipitated upon cooling. In concentrated solutions a precipitate occurs, which, when dissolved in alcohol, leaves, upon evaporation, a crystalline salt.

Corrosive Sublimate.—No precipitate in dilute solution.

In *concentrated sulphuric acid* it dissolves with yellow color, which quickly changes to a pink-red; after five minutes it assumed a dirty-red color, which, after two to three hours' standing, begins to assume, on the outside rim, a violet-blue color, and after four hours' standing the whole assumes a clear indigo-blue, which remains for the space of an hour and gradually changes to a dirty-blue color and fades away. In order to make this reaction successfully, the crystals must not be mixed with *any* impurities (jervia or coloring-matter).

The behavior of this substance with sulphuric acid cannot be confounded with that of veratria, though at some of the stages it has great similarity—the difference being that at no stage does veratria take on the blue color.

If to the sulphuric acid solution a drop or two of bromine water be carefully added, or bromine vapor, the color change takes place almost immediately, and a blue coloration is produced which remains unchanged.

With *sulphuric acid and sugar* (Weppen's reaction for veratria)

it gives a yellow color which changes to blue, which remains constant.

With *nitric acid* no characteristic reaction is produced.

Hydrochloric acid dissolves it without coloration, and when heated takes a light-yellow color.

The poisonous shellac-like substance obtained after evaporation of ether, which was previously referred to, gave upon investigation the same physiological results as the crystalline poisonous substance, and its chemical reactions were the same, with the exception that they were not as clearly defined. It is either the crystalline substance rendered amorphous by the admixture of a small quantity of resinous material, or it is the crystalline substance in a modified form, such modification being known to exist in veratria. See Dragendorff, "Gerichtliche Ermittelung von Giften," p. 211; "Archiv der Pharmacie," Band 6, 1877.

The physiological action of the root of Veratrum viride does not, of course, depend entirely upon the action of any one principle, but that it does largely depend upon the action of this crystalline substance, soluble in ether, there is no question. The substance I find to be neither identical with veratria, jervia, nor the veratroidia of earlier investigators. It responds to all the tests for an alkaloid, but as it does not, to my knowledge, respond to the tests for any other known alkaloid, I would suggest that it be called *veratridia*.

In the rhizome of Veratrum viride the percentage of veratridia is so small—not exceeding one-fifteenth to one-twentieth of one per cent.—and the difficulty of its separation is so great, that in cases of poisoning, unless the dose administered was unusually large, it would be impossible to isolate the veratridia after death.

In one case, where 10.0 c.c. of the fluid extract veratrum viride were administered to a cat, jervia was isolated after death, but not the veratridia.

September, 1877.

ON WHITE WAX AND ITS ADULTERATIONS.*

BY P. W. BEDFORD.

QUERY 12.—It has been asserted that nearly all the white wax now found in the market is adulterated with paraffin, Japan wax, and stearin. Is this so, and how can the adulterants be accurately detected?

THE fact that white wax, as found in the various branches of commercial traffic, is largely adulterated is patent to all who have ever made either inquiry or examination. Even the crude or yellow wax of the market is largely adulterated, and in some cases almost entirely factitious. The present query relating only to the bleached article, the writer has confined his investigations to that variety alone, but by way of preliminary remark would state that not all kinds of yellow wax are suitable for the purpose of bleaching. Inquiry leads to the information that North Carolina wax bleaches most readily and satisfactorily of all the kinds that are found in the New York market.

The process of bleaching is one of extreme simplicity. The yellow wax having been carefully selected, is melted, strained, and run into a tank, from which it is conducted into another, the bottom of which is connected with a small metal trough having perforations. A quantity of the purified wax is then run into the trough, and drops through the perforations upon a wheel or cylinder which revolves in a trough of water. The quickly chilled wax thus takes the form of thin ribbons, and being removed from the tank as rapidly as it enters, it is spread on large wooden frames in the direct sunlight. It is frequently sprinkled with filtered water, and turned over. The outer surface loses its characteristic color and assumes a dirty-white hue, and, depending upon the amount of sun exposure, it is, after the course of twenty-four to seventy-two hours, gathered in, remelted, and the process repeated three or four times, in order to expose all parts of the wax to sunlight. When sufficiently bleached it is then cast into circular cakes, and frequently again exposed to direct sunlight in single layers under glass, when it is ready for sale. Besides the loss from wax rejected on account of impurities, there is a loss from a portion which loses its characteristic properties by the process of manufacture.

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* Read at the Fourth Session.

Samples of the wax in the various stages of its manufacture are herewith presented.

White wax, as a name, is a misnomer. Wax which has been bleached by the process above-named is not white, but of a yellowish tint, more nearly described as of a cream color. Pure bleached wax has a specific gravity varying from .950 to .968, and more generally approaching .962. The other figures are extremes, and if either below .950 or over .970 may be considered impure.

The query seeks to know whether the white wax of the market is largely adulterated, what the adulterants are, and how they may be detected.

In reply to whether white wax is largely adulterated, I unhesitatingly answer that *it is*. From inquiry and personal knowledge I believe that seventy-five per cent. of all the white wax sold is adulterated. This adulteration, or, in some cases, sophistication, is done by the manufacturer, and at first hands is done openly and sold with the understanding that it is an impure article, but before it reaches the consumer it is usually forgotten, and is sold as white wax. The larger part of the impure or adulterated wax does not, however, go through the channels of the drug market, but is used for manufacturing and domestic purposes. The kinds sold by the druggists are generally either pure or largely composed of wax, the adulterants being in but a small proportion, and in the latter case are added either to improve the color or to facilitate the working of wax flowers. For the latter purpose, pure wax is too brittle.

The principal impurities are paraffin or stearin, and the sophistication is ceresin, although ceresin is doubtless used also as an adulterant. As already stated, the general average specific gravity of white wax is .962. Paraffin has a specific gravity of .860 to .888. The sample shown you, which is of the variety known as "hard" paraffin, is the kind which is principally bought to adulterate white wax, and this piece has the specific gravity of .887. Having made mixtures of this paraffin with some white wax which I knew to be perfectly pure, I found that the specific gravity, as might be expected, was lowered in proportion to the impurity. Still the varying specific gravity of pure wax, and of various specimens of paraffin, do not make this kind of determination a reliable one. Stearin is set down in many works as having a specific gravity approaching that of water, but I have found several different samples to be about .925.

Ceresin, a species of purified fossil paraffin, from Austria and adjacent localities in Europe, is now being largely used to supplant, sophisticate, or adulterate white wax. Its specific gravity very nearly approaches that of paraffin. Japan wax, Chinese wax, and other varieties of vegetable wax, formerly used to adulterate white wax, are now obsolete for these purposes.

Let me now state the characteristics of white wax and the detection of adulterants. White wax, as usually found, is in flat round cakes of a yellowish-white color, is entirely soluble in 5 parts of chloroform, at a temperature of 85° F. At a temperature of 80° F. to 85° F., it is plastic when worked between the fingers, and retains in some degree the odor of honey. The chloroformic solution alluded to should give no deposit on standing at temperature named, but on reduction of temperature it has the appearance of an emulsion. When chewed, it separates, and does not again cohere while any moisture remains. The cakes usually have the upper surface slightly convex, the edges having a ragged or uneven appearance, and it is asserted that pure wax cannot be successfully moulded in metal moulds which give it a smoother appearance.

The cakes of pure wax, when held to the light, have an opalescent appearance, not transmitting light to the same degree that it does when adulterated with paraffin or ceresin.

Two test liquids of alcohol, diluted to indicate specific gravities of .950 and .970, should be kept handy. In the first, pure wax will always sink; in the latter, always float.

These physical tests are sufficient for the comparatively easy detection of adulterated or sophisticated white wax.

Two chemical tests alone are needed to complete the subject of detecting the adulterants alluded to. Paraffin and ceresin are detected by sulphuric acid, which has no effect upon them, while it entirely carbonizes and destroys white wax.

To determine the presence of these two adulterants, 1 part of wax is placed in a flask, with 15 to 20 parts of sulphuric acid, and gently heated. After a few moments the heat is withdrawn, and when cool, the paraffin may be separated, washed, and dried. Its weight will give a comparatively accurate determination of this impurity.

Stearin may be readily detected by the fact that it so readily saponifies. A few grains of dried carbonate of soda (soda carb.

exsic.) is placed in a test-tube, a weak solution made by heat, the suspected wax dropped into it, when the watery fluid becomes opalescent, and on cooling, hardens more or less, having all the characteristics of a soap.

Pure wax separates, and the watery fluid is clear or very slightly opalescent.

Other tests might be given, but these simple ones are sufficient to determine all the pharmacist desires to know as to the purity of white wax for practical purposes.

In passing, I may state that large quantities of bleached ceresin are now being sold, and the shape and appearance of it are such as to cause it to pass readily to the casual observer.

I have examined numerous brands of wax during the year, and while there is no trouble to procure pure sun-bleached, or so-called, white wax, yet the cupidity of the purchasers is such as to cause nearly every manufacturer, if not every manufacturer, to make wax which is not pure. Another reason is, that impure wax is whiter, and pleases the eye of more purchasers than does the pure article.

With this paper is submitted samples of pure sun-bleached or white wax, also samples of several brands which are more or less adulterated, and sixteen samples made into the same moulds, which, at my request, are various mixtures of wax and paraffin, also of wax, stearin, and paraffin, in order that you might be able to compare known mixtures of impure wax with the pure article.

I purpose to continue the subject another year, in order that I may, if possible, collect samples of the great number of brands to be had in the several cities of our Union. I have sought for some liquid solvent which might be readily used as a test for the adulteration of wax; but, although some very interesting facts have thus been ascertained, I have as yet failed in my object. The great difficulty in the subject is to find some special test which is easily applied and sufficiently distinguishable, as all the ordinary adulterants have nearly the same fusing-points, and their solvents are of the same general character.

III. CHEMISTRY.

THE BROMINE PRODUCTION OF THE UNITED STATES.*

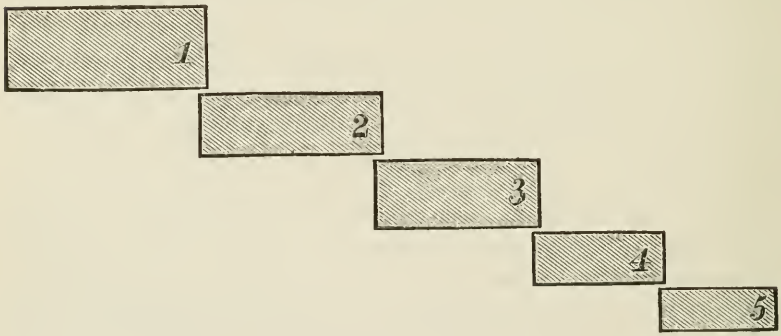
BY HENRY S. WELLCOME, NEW YORK.

(In answer to Query 53.)

THE only available source of bromine supply is the residual liquor from the salt furnaces, technically known as bittern.

A brief description of the process employed by our leading manufacturers in separating this important element from the salt liquors, may be of interest to you. The original salt liquor or brine is pumped out of the ground at 9° B., evaporated to about 15° in long iron pans; then allowed to settle, and is further evaporated in wooden tanks, heated by steam pipes, to the point of crystallization. The first crystallization yields the best salt of commerce; these tanks, five in number, are placed one above another, in the order shown in the drawing; each day the liquor is run off from No. 1 to No. 2, next day to No. 3, and so on until

FIG. 61.



it reaches No. 5, the crystallized salt being removed from each tank or so-called grainer, after draining off the liquor. The brine, when it reaches No. 5, is bittern, and consists chiefly of chlorides of calcium, magnesium, sodium, and some aluminum, with varying percentage of bromides of sodium and calcium.

Tank No. 1 is each day filled with fresh brine, and thus the process becomes continuous. The bittern marking 30° to 38° B., is

* Read at the Sixth Session.

evaporated to about 45° B. By this further evaporation an additional percentage of impure salt is removed, the liquor is then run into stone stills, material for generation of chlorine added, and heat applied by means of steam injected directly into the still, until all the bromine has been eliminated and vaporized, which is conveyed through a condenser into a receiver.

Several recent improvements have been made in the process of bromine manufacture, most of which consist in the form of the bottom of the still, and appliances for condensing the vapor. The most important of these are the devices of F. W. Arvine.

The principal bromine producers in America are: Victor G. Bloede & Co., Parkersburg, W. Va (have recently disposed of their works); Herman Lemer, Mason City, W. Va.; John J. Jubler, Pomeroy, Ohio; Mason City Salt and Mining Company.

The production of bromine was first commenced in the vicinity of Parkersburg, by Hegeman, a Danish chemist, formerly employed by the Pennsylvania Salt Manufacturing Company.

Mr. Hegeman's operations were of an experimental character at first, and he produced but a limited quantity. As there was at that time very little demand, he realized $4 to $8 per pound for all he made. Mr. Hegeman patented the use of stone stills and steam in the manufacture of bromine and preparations. His claims and patents, as well as the small demand, prevented others from attempting to enter into competition. However, as the use of the bromides became more general, others began to manufacture bromide, their processes varying but little from Hegeman's, though modifications in details have been introduced by each.

Herman Lemer is now supposed to be the largest producer of bromine. He was, formerly, a poor shoemaker at Natrona, Pa., of limited education, but with rare energy, and has developed fine executive ability, which has led him to his present position.

The Ohio and Kanawha salt region yields bittern at least twice richer in bromine than any other yet discovered, and hence holds the balance of power over the whole world.

It is a remarkable fact that the Syracuse and other New York and Western bitterns do not contain any or but a slight trace of bromine.

The quality of bromine produced annually varies greatly, due to the extreme depression and uncertainty of the salt trade, upon which the bromine business is entirely dependent.

The salt interests have suffered much during several years past,

as more salt is made than can be sold, and for the last two years it has sold steadily for less than actual cost of production. The uncertainty of the salt furnaces working has induced bromine manufacturers to erect and operate bromine works at every furnace, so that when one shuts down on the production of salt, they may not be wholly thrown out of the production of bromine.

The capacity for producing bromine has risen, during the years 1875 and 1876, to about three times that of 1874 (owing to the facts given above), while the actual production has not materially increased. The capacity at present is estimated by manufacturers as 3000 pounds per day, while the actual production does not exceed 1000 pounds. These figures are intended to convey the average production. There are indications that the production will be lessened for a time, yet that it will be sufficient to supply all demand.

The exportation of bromine has been reduced to a very small matter. The cost and risk of transportation are so great that European makers of bromides cannot compete with the American manufacturers; no steamship company will carry bromine, and it is becoming very difficult to induce vessels to take it at any price.

Recently, owing to the very high prices at which bromides are held in the European market, several lots have been exported, in all about 50,000 pounds this year.

Owing to the great advantage possessed by American manufacturers in the production of the bromides, it is believed that the exportation of bromine will soon entirely cease. The consumption of bromine in the form of the bromides has greatly increased during the past twelve years, as you are all aware. The bromide of potassium being the principal salt, but, during the last three or four years, the bromide of sodium, bromide of zinc, and several other bromides are becoming very popular.

The only really new and very recent application of bromine is its use by a Paris firm, within a few months, in the production of a new anilin color.

I will here express my obligations to Mr. Victor G. Bloede, who has very kindly furnished me the principal points used in this paper, as also to other parties who have furnished me valuable information on the subject.

September 1st, 1877.

ON MAGNESIA.*

BY GEORGE LEIS, LAWRENCE, KANSAS.

QUERY 17.—What is the amount of alkali in the commercial calcined and carbonate of magnesia?

FROM the unfortunate wording of the above query, "What is the amount of alkali in commercial calcined and carbonate of magnesia?" the writer is somewhat in doubt as to the meaning intended by its author.

It is impossible to tell whether, by the word *alkali* (strictly speaking there could be no alkali present), he means to designate the alkaline salts, sulphate and carbonate, that are known to exist in small amount, as impurity from imperfect washing in the magnesia and magnesium carb. of pharmacy, or whether he intends the word *alkali* to include everything capable of neutralizing an acid, in which case his query would refer to the amount of magnesia (MgO), both free and as carbonate, together with the minute amount of alkaline carbonate always present.

Upon either supposition the word *alkali* is improperly used.

In view of this ambiguity, I have endeavored to answer the query with both its possible constructions.

I. *Amount of alkaline salts in calcined magnesia.*

These salts consist of sodium carbonate and sodium sulphate, with perhaps a trace of sodium chloride. The relative proportions of these I have not attempted to determine, and they probably vary in different samples of the same make. The sodium was weighed as chloride, and the amount of soda (Na_2O) calculated therefrom in the two samples examined, was as follows:

Powers & Weightman's Heavy Calcined.—Soda (Na_2O), 1.10 per cent.

Husband's calcined, 1.06 per cent.

As the above two samples gave figures agreeing so nearly, it was not thought worth the while to examine others.

II. *Amount of base, both free and combined, as carbonate (magnesia, magnesium carb., and sodium carb.).*

No attempt was made either to determine the amount of sodium carbonate, as it was shown by the above experiments to be present only in minute quantity, or to separate the magnesia from the mag-

* Read at the Fourth Session.

nesium carb. Merely the neutralizing power upon acids was determined by means of standard acid and alkali, the result expressing the amount of magnesia (MgO), both as such and as carbonate, plus the small amount of sodium carb. The latter is entirely ignored in the figures given below, the whole basicity being calculated as due to magnesia. Probably a deduction of about one-half per cent. (.5) from each of the percentages given, would correct for the presence of sodium carb., and give the true percentage of magnesia.

Five samples were examined, as follows:

Magnesia Carb., Pattinson's.—Magnesia (+ soda), 40.75 per cent.

Magnesia alba, Jennings's, 39.72 per cent.

Light Calcined Magnesia, Jennings's best.—Magnesia (+ soda), 78.01 per cent.

Heavy calcined magnesia, Powers & Weightman's, 95.46 per cent.

Husband's.—Magnesia (+ soda), 90.33 per cent.

It may be well to state that the two samples of magnesia from which the above results are obtained were taken from my own store, such as I had in stock, with the one exception, Jennings's light calcined, *best*, which was kindly sent me by Prof. John M. Maisch, of Philadelphia, and that all the analyses recorded in this paper were made with the "utmost care" and accuracy, and it is hoped that the query is satisfactorily answered.

ON DIALYZED IRON.*

BY W. H. PILE, PHILADELPHIA.

The attention of the medical fraternity has recently been directed to the subject of dialyzed iron, or, as termed in Europe, ferrum oxydatum dialysatum. Although not entirely unknown here, having been employed in France and Germany for some time, and its therapeutic virtues highly extolled in various European journals, yet it appears to have suddenly sprung up before us, and the demand for it could hardly be met at first. However, accommodating manufacturers, ever alive to the wants of their co-laborers, soon undertook to supply the new demand, and learning that the only genuine article, so called, from Paris, would cost about $5 per

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* Read at the Fifth Session.

pound, our friends generously offered their equally reliable solution at only $3 per pound. In a couple of weeks the price was still lower, falling to $2.50, $2, $1.50, and we have now before us a card in which the writer, frankly admitting the enormous and unreasonable charges of his predecessors, offers a solution at $1 per pound. It has certainly not reached bottom yet.

Having our thoughts directed to this subject, and learning from Graham's investigations on dialysis that chloride of sodium would pass through a parchment septum with greater rapidity than any other crystalloid substance, we concluded to use a solution of carbonate of soda in place of aq. ammonia, which was proposed by others. From a few random notes taken at the time, August 1st, 1877, we read: That to a pint of sol. sesquichlor. iron, U. S. P., add slowly, and with constant stirring, a cold saturated solution of carb. soda until a small quantity of the precipitate carb. iron remained undissolved. Poured the whole on the floating dialyser, which consisted of a sheet of genuine parchment-paper firmly bound to a broad hoop and immersed in a tub of pure water. Here I may remark that the gravity of this solution was 1.175. In twenty-four hours, the water in the tub, which had become strongly saline, was replaced with fresh water. The gravity of the iron solution was now only 1.055. This was found to depend not alone on the removal of the chloride of sodium which had passed through the parchment, but upon the passage upwards of a large quantity of water. By continuing this daily change of water for five days, the gravity of the iron solution becoming daily less and the quantity at the same time increasing, I found the quantity in the dialyser to be nearly 5 pints, and it was then nearly tasteless. Replacing the solution in the dialyser again, with the addition of a slight excess of sol. carb. soda, continued the process for three days more. The finished product was then found to have a gravity of 1.0295, tasteless, clear, and bright. By evaporating 100 grs. of this to complete dryness 5 grs. were left. Samples of this solution are here shown. From an experiment with a solution obtained from another house, the gravity of which was only 1.022, I obtained a dry residue of not quite 3 grs., while from still another, of gravity 1.029, a residue of 5 grs. was left. The taste of all these samples was about similar. They all show the presence of hydrochloric acid by precipitating with ammonia, filtering, and saturating with pure nitric acid, and testing with nitrate of silver. The amount of acid in these, however,

I did not determine from want of time. The gravity I suggest would give a reliable test of the strength of the preparation, 1.029 = 5 per cent.

ON HYDROBROMIC ETHER.*

BY JOSEPH P. REMINGTON.

Hydrobromic or bromhydric ether, C_2H_5Br, although discovered so long ago as 1827, has remained in comparative obscurity until lately.

Attention has been drawn to it through its asserted superiority as an anæsthetic to the agents usually employed, and reasoning from its chemical composition and the therapeutical effects of its component parts, it is really surprising that it has not been brought to notice before, and used extensively. Under the head of a "New Anæsthetic Agent,"† a notice, as follows, appears of it: "Rabuteau, in a memoir read before the Académie des Sciences, states that he has investigated the physiological properties and mode of elimination of hydrobromic ether. He has satisfied himself that this anæsthetic agent, which possesses properties intermediate to those of chloroform, bromoform, and ether, might be advantageously employed to produce surgical anæsthesia. The hydrobromic ether is neither a caustic nor an irritant. It can be ingested without difficulty, and applied without danger, not only to the skin but to the external auditory meatus and to the mucous membrane. It is eliminated completely or almost completely by the respiratory passages in whatever way it may have been introduced into the system." Med. & Surg. Rep., Feb. 24th.

Dr. Lawrence Turnbull, of Philadelphia, is at present engaged in investigating its physiological properties, and measurably confirms Rabuteau in his views, although his labors are as yet not complete. At the request of Dr. T. the writer undertook the preparation of the compound, and found that several methods had been suggested. Almost all of them were tried with a view of developing the most practical formula, and the processes will be considered in the order of their publication, and all, it will be seen, depend upon the

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* Read at the Fourth Session.

† Amer. Jour. Pharmacy, March, 1877.

action, in some way or other, of bromine or alcohol. Serullas, who is entitled to the credit of discovering the liquid, prepared it as follows: One part of phosphorus and forty parts of alcohol of 38° Bm., are introduced into a tubulated retort, and seven or eight parts of bromine gradually added, whereupon the mixture becomes heated and hydrobromic and phosphorous acids are produced. The tubulus is then closed, the mixture distilled at a gentle heat, the distillate collected in a cooled receiver, and the hydrobromic ether separated from it by water, to which, if the distillate contains acid, a small quantity of potash is added.

Löwig prepares it as follows: "Absolute alcohol gradually mixed in a distillatory apparatus with a treble quantity of bromine, and heated from without towards the end of the process yields a distillate, consisting of two layers. The lower reddish stratum, which consists of bromide of ethyl, a small quantity of bromide of carbon, C_2Br_4, and free bromine, is freed from the latter by agitation with dilute potash till it loses its color, and then from bromide of carbon by distillation."

De Vrij states that it may be prepared by distilling four parts pulverized bromide of potassium with five parts of a mixture of two parts strong sulphuric acid and one part of alcohol of 96 per cent.

Personne ("Compt. Rend.," lii, 468) recommends for its preparation the use of amorphous instead of common phosphorus. 40 grams amorphous phosphorus are mixed in a retort with 160 grams absolute alcohol, and 100 grams of bromine are slowly poured in through a narrow tube passing through a cork fitted into the neck, the retort being left cool. The mixture is then distilled into a cooled receiver, the distillate treated with water, and then dried over chloride of calcium and rectified.

Hoffmann, whose valuable researches on the anilins have rendered his name famous, in the course of his indefatigable pursuit after colors hit upon a method of making ethyl bromide pure enough for his purposes by simply heating amyl bromide with ethyl alcohol.

Amyl bromide, $C_5H_{11}Br$, is prepared by saturating amyl alcohol with gaseous hydrobromic acid, mixing the saturated solution with an equal volume of the aqueous acid, sp. gr, 1.5, and digesting slowly at the heat of a water-bath in a suitable vessel, finally washing the product with water.

The reaction which takes place when amyl bromide and ethyl alcohol are mixed is represented by the following formula:

$$B_5H_{11}Br + C_2H_5OH = C_5H_{11}OH + C_2H_5Br.$$

De Vrij's process, whilst promising good results with a minimum amount of labor, was found to produce some common ether through the action of the sulphuric acid on the alcohol, which thus contaminated the product. The process of Serullas was not desirable on account of the necessity for great care in avoiding explosion on bringing such active agents as phosphorus, bromine, and absolute alcohol together.

Bromoform, $CHBr_3$, might be a contamination also here, as its method of production by action of bromine and potash on alcohol would indicate.

The following formula in the writer's hands was found to possess less objections, and to produce a purer hydrobromic ether than any of the others that were tried:

Thirty-three troy ounces of absolute alcohol are introduced into a retort or flask, and the whole placed in an ice or cold water-bath, and allowed to become thoroughly cooled. Six troy ounces of amorphous phosphorus are then added to the cooled alcohol and the whole shaken. A glass-stoppered bottle of the proper size to hold twenty-six troy ounces of bromine is now selected; this quantity is then weighed into it, and having inserted a small fragment of broken glass between the stopper and the lip of the bottle the stopper is secured in this position, so that the bromine may be readily dropped on inverting it without the escape of any more fumes than is necessary.

The bromine is now to be slowly dropped into the mixture, care being taken to avoid too great elevation of temperature. When all of the bromine is added the whole mixture is allowed to stand twenty-four hours, when the flask is connected with a good distillatory apparatus and placed in a water-bath, and the distillation is continued as long as any liquid comes over. The distillate is then washed with water, and if acid to litmus-paper a small quantity of potash or soda solution is added to the water, and after separating the hydrobromic ether from the water it is redistilled after adding some fragments of chloride of calcium to the flask, to free from remaining traces of water.

Hydrobromic ether is a transparent colorless liquid, having an agreeable ethereal odor; heavier than water; specific gravity, 1.40

(Löwig); vapor density, 3.754 (R. Marchand); very volatile; boiling-point, 40.7 C., when the barometer stands at 757 m.m. (Pierre). Löwig considers its taste as strongly and disagreeably sweetish with a somewhat burning after-taste. The vapor when inhaled exerts an anæsthetic effect like chloroform. It is sparingly soluble in water, but mixes in all proportions with alcohol and ether.

It burns with difficulty, but with a beautiful green flame, which does not smoke, a strong odor of hydrobromic acid being at the same time evolved (Löwig). It is not decomposed by nitric acid, sulphuric acid, or potassium. With ammonia it yields hydrobromate of ethylamin.

PHILADELPHIA, August 25th, 1877.

CHLORAL HYDRATE AND CAMPHOR.*

BY JOSEPH ROBERTS, BALTIMORE.

QUERY 51.—What is the nature of the union in the combination of equal parts of chloral hydrate and camphor?

WHERE that affinity causing the phenomena we know under the name of solution ceases, and that creative affinity that we recognize as chemical commences, is a problem somewhat difficult to define.

That the natural forces that control the solution of one body by another is akin to chemical affinity, differing but in degree of intensity, is, I think, a reasonable proposition.

The reaction resulting when chloral hydrate and camphor are brought in contact, is so marked that we are naturally led to the supposition that a new body has been formed, and to search for those definite peculiarities that, as such, it should present.

Upon examination, however, so far as our sense of smell or taste guides us, we find that we recognize in the compound both of its constituents in nowise modified, other than we might expect from their admixture.

When water is added, an immediate separation of constituents results.

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* Read at the Third Session.

The experiments of Mr. E. M. Saunders, published in the October number of the "American Journal of Pharmacy" (1876), prove that the compound may also be resolved into its constituents by fractional distillation.

The boiling-point he found to be 225° F. This, it is true, is some sixty odd degrees lower than the boiling-point of chloral hydrate, yet as the temperature of the liquid, upon the continued application of heat, rises until at about 300° F., all the chloral hydrate passes over, followed by the sublimation of the camphor twixt the temperature just named and 400° F. The inference is fair that whilst the variation of the boiling-point seems to indicate some radical change in the nature of the compound, yet when considered in connection with the other facts, that the specific gravity of the compound is the mean of the gravity of its constituents; that its constituents may be entirely disassociated by fractional distillation; that the compound separates into its constituent parts upon the addition of water, forces the conclusion that the compound in question is not chemical in the ordinary meaning of the term, but simply a solution of chloral hydrate in camphor, and so I reply to Query 51.

ON THE CHARACTER OF THE CREAM OF TARTAR SUPPLIED TO THE PUBLIC OF ONTARIO.

BY W. SAUNDERS, LONDON, ONTARIO.

With a view to ascertain the character of the cream of tartar with which the public are supplied in this western part of Canada, I purchased in November last nineteen samples of this substance, twelve of which were obtained from grocery stores, embracing most of the larger dealers and family grocers; the other seven from drug stores.

The examples were all treated as follows: one hundred grains were heated with six ounces of distilled water in a beaker to the boiling-point, then transferred to a tared filter, the beaker cleansed with a further portion of hot water, which was also poured upon the filter, after which hot water was again added until the liquid passed through tasteless. The filters were then thoroughly dried and weighed. A portion of the filtered fluid in each instance was treated with a solution of pure caustic soda, to ascertain if alum were present, and another portion of the same filtered liquid pre-

pared for microscopic examination by placing a few drops on a glass slide, and setting it aside to evaporate spontaneously.

From numbers one to twelve inclusive are embraced the samples obtained from grocers; and from thirteen to nineteen inclusive those from druggists; all were purchased in London.

No. 1.—Taste astringent, chalky, and slightly acid; produced a gelatinous precipitate with the solution of soda, and under the microscope octohedral crystals were numerous, mixed with a few which appeared to be cream of tartar. The insoluble residue weighed 38 grains.

No. 2.—Had a strong alumy taste and was slightly acid; yielded a gelatinous precipitate with the soda solution, and under the microscope a large crop of octohedral crystals mixed with those of cream of tartar. Insoluble residue, 22 grains.

No. 3.—Taste earthy and slightly acid, not astringent; yielded no gelatinous precipitate with the soda solution. Under the microscope the crystals were few and small; some of them resembled cream of tartar crystals, others appeared to be tartrate of lime. Insoluble residue, 79 grains.

No. 4.—Taste acid, earthy, and astringent; a gelatinous precipitate resulted on addition of the soda solution; the microscope showed small octohedral crystals of alum, mixed with a few crystals resembling those of tartaric acid. Insoluble residue, 86 grains.

No. 5.—Taste astringent and earthy, scarcely acid; yielded a heavy gelatinous precipitate with the soda solution; crystals chiefly octohedral. Insoluble residue, 94 grains.

No. 6.—Taste earthy, acid, and slightly astringent; the soda solution produced a slight gelatinous precipitate; crystals of various forms, some octohedral, some resembling cream of tartar, and others tartrate of lime. Insoluble residue, 55 grains.

No. 7.—Taste gritty, earthy, and slightly acid; yielded no precipitate with the soda solution; crystals appeared to be those of cream of tartar. Insoluble residue, 38 grains.

No. 8.—Taste very earthy, slightly astringent, with very little acidity; the soda solution produced a gelatinous precipitate; the microscope revealed chiefly octohedral crystals. Insoluble residue, 85 grains.

No. 9.—Taste earthy, astringent, scarcely acid; yielded a heavy gelatinous precipitate with the solution of soda, and an abundant crop of octohedral crystals under the microscope. Insoluble residue, 76 grains.

No. 10.—Taste nearly normal; no gelatinous precipitate with the soda solution; numerous crystals of cream of tartar under the microscope. Insoluble residue, 16 grains.

No. 11.—Taste earthy and astringent, scarcely acid; yielded a gelatinous precipitate with the soda solution, and a supply of small octohedral crystals under the microscope. Insoluble residue, 91 grains.

No. 12.—Taste gritty, slightly earthy, astringent, and acid; yielded a gelatinous precipitate with the soda solution, octohedral crystals mixed with those of cream of tartar under the microscope. Insoluble residue, 28 grains.

No. 13.—Had a nearly normal taste, but slightly earthy; yielded no precipitate with the soda solution, and well-formed crystals of cream of tartar under the microscope. Insoluble residue, 22 grains.

Nos. 14, 15, 16, 17, and 18 had the normal taste of pure cream of tartar; gave no precipitate with the soda solution; the microscopic slides displayed numerous and well-formed cream of tartar crystals. Insoluble residue, No. 14, 3 grains; 15, 3 grains; 16, $3\frac{3}{4}$ grains; 17, 5 grains; 18, 6 grains.

No. 19 was obtained from a wholesale druggist along with No. 17. The latter was sold as pure cream of tartar, the former as a second-class article at a low price, in order to compete with the cream of tartar offered by grocers. No. 19 had an earthy, slightly astringent, and somewhat acid taste, yielded a slight precipitate with the soda solution; the microscope showed a few octohedral crystals, mixed with a number of others which appeared to be cream of tartar. Insoluble residue, 70 grains.

The insoluble matter, where it amounted to more than 5 or 6 per cent., was almost identical in each case, and when examined under a high power of the microscope so exactly resembled terra alba as to require no further testing.

It will thus be seen that out of the seven examples obtained from druggists, five of them, Nos. 14, 15, 16, 17, and 18, were pure cream of tartar, containing from 3 to 6 per cent. only of insoluble matter, chiefly tartrate of lime, which is almost always present as an accidental impurity in the best samples of cream of tartar. No. 13 was cream of tartar adulterated no doubt with from 15 to 20 per cent. of terra alba to cheapen it. No. 19, as I have already explained, was known to be an impure article, and sold as such.

Among the twelve samples obtained from the grocers only one

approached the normal standard, and this contained sixteen per cent. of insoluble residue. The others were all adulterated with from 28 to 94 per cent. of that insoluble earth terra alba, the soluble constituents consisting of varying proportions of alum and cream of tartar or tartaric acid.

These disreputable compounds are put up usually in square tins, nicely painted and labelled with the words "cream of tartar," and I am told by the dealers that they are manufactured in the city of Toronto, from which centre they are scattered over this province by tons and scores of tons. Having now an adulteration act in force in Canada similar in its provisions to that recently put in force in Great Britain, which provides for the punishment of those who manufacture or sell such fraudulent compounds, it is to be hoped that this wholesale imposition will not be much longer tolerated, but that the heavy hand of the law may visit all such unprincipled dealers and oblige them, if they do business at all, to deal honestly.

ON SALICYLIC ACID, ITS SOLUBILITY AND PHARMACEUTIC USES.*

BY RICHARD V. MATTISON.

The writer having accepted Query 42, has no apology to make for the few remarks appended. They are mainly gleanings from the current literature of the day, with what verification the writer has found opportunity to make. The subject may be treated under its appropriate headings, and naturally one first drops into a consideration of its *composition*. Chemically, it is represented by the formula $C_{14}H_6O_6$, which we note as isomeric with paraoxybenzoic acid. This isomerism is all the more curious from the fact that while the sodic phenate yields, by the action of carbon dioxide, sodic salicylate, the potassic phenate yields, under the same circumstances, potassic paraoxybenzoate.

Sources.—First may be mentioned salicin, $C_{26}H_{18}O_{14}$, which, by continued boiling with dilute acids and by the absorption of two equivalents of water, splits into glucose, $C_{12}H_{12}O_{12}$, and saligenin, $C_{14}H_8O_4$. This saligenin may be considered as an alcohol bearing

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* Read at the Fifth Session.

the same relation to salicylic acid that the ordinary ethylic alcohol does to acetic acid.

When saligenin is oxidized, it loses two equivalents of H and is converted into salicylous acid, $C_{14}H_6O_4$, or perhaps a better name is salicylic aldehyd, as it bears the same relation to salicylic acid that ordinary aldehyd does to acetic acid.

When this aldehyd is acted upon by powerful oxidizing agents, it is converted into salicylic acid, in the same manner as ordinary aldehyd, through the oxidation caused by the action of *cerevisiæ fermentum* or any special ferment is converted into acetic acid.

As any substance yielding ethylic aldehyd will yield acetic acid, just so any substance yielding salicylic aldehyd will, upon proper treatment, yield salicylic acid. This aldehyd occurs naturally in the flowers of the *Spiræa ulmaria* and other Spirææ, and also in the flowers of *Crepis fœtida.*

Even the animal kingdom contributes its share to the general good of the community, by secreting this substance in the warty excrescences of the larvæ of the willow beetle, the *Chrysomela populi.* Thus it will be readily seen that nature took the initiative, and the lowly grub was probably the first to manufacture the article in question directly from the delicate young shoots of the *Salix alba*, and in the question of priority among manufacturers certainly carries off the laurels.

Until recently, the most fruitful source of salicylic acid has been the volatile oil obtained from the Gaultheria procumbens, which consists of about 90 per cent. of methyl-salicylic acid united with a peculiar terpen, called gaultherilen.

From this oil the salicylic acid is readily obtained by boiling with solution of potassic hydrate as long as the methylic alcohol is liberated, and the residue precipitated by hydrochloric acid, the precipitate washed with cold water and recrystallized from alcohol.

While prepared from the above sources, salicylic acid was little more than a curiosity, although its chemical and physiological properties were being gradually investigated. During this time the fact having been observed of the splitting up of salicylic acid, under the influence of strong heat, into one molecule of carbolic acid and two molecules of carbon dioxide, what could be more apt than the attempt to combine carbolic acid and carbon dioxide with the intention of forming, synthetically, salicylic acid?

We need not attempt to portray the eminent success of the experiments of Prof. Kolbe, of Leipzig, to whom the gratitude of the

pharmaceutical world is due for his practical process for preparing salicylic acid on a commercial scale, and it is this process which we shall briefly proceed to state.

Phenic (or carbolic) acid, or phenol, is neutralized by sodic hydrate, and the solution evaporated to dryness. When dry, the resulting sodic phenate is introduced into a retort and heated carefully by means of an oil-bath to 212° F. Dry carbon dioxide is then conducted into the retort, and the heat continued up to about 356° F. The phenol now begins to distil over, and the heat is continued until a temperature approaching 480° F. is obtained. When the phenol ceases to distil over, the process is ended, and the sodic salicylate may be then removed from the retort, dissolved in water, precipitated by hydrochloric acid, expressed, washed, and recrystallized. The coloring-matter adheres with great tenacity to the crystals, hence the commercial acid is usually slightly colored. The purest acid obtainable is that purified through the agency of the peculiar method of separation known as dialysis, and hence the name of dialyzed salicylic acid.

The reaction that occurs is the following:

When two equivalents of sodic phenate are heated in an atmosphere of carbonic dioxide, one equivalent of phenol distils over unchanged, dibasic sodic phenate being formed, which, as it forms, absorbs two equivalents of carbon dioxide combining with it, and thus producing dibasic sodic salicylate.

Following the preparation of this acid may properly come the

Tests of Purity.—In this connection Prof. Kolbe gives the following: Dissolve $\frac{1}{2}$ gram of salicylic acid in ten times the quantity, say 5 c.c., of strong alcohol, pour the clear solution into a watch-glass, and allow it to evaporate spontaneously. The residual salicylic acid forms around the edge of the watch-glass a ring of beautiful efflorescent aggregated crystals. This efflorescent mass is pure white if the acid used has been recrystallized, but yellowish or yellow if the simply precipitated acid be used. If the color be brownish or brown, the acid should be rejected as unfit for use.

For medicinal purposes only, the crystallized sublimed acid should be used.

The presence of carbolic acid is shown by the test of Prof. Almén. He employs ammonic hydrate and chlorinated soda, which produce with phenol a blue color, turning red with acids, and blue again upon supersaturation with an alkali. Solutions of phenol containing 1 part to 5000 produce the blue color at once, solutions

1 in 50,000 only after twenty-four hours. Salicylic acid gives no reaction. It is important that an excess of chlorine be avoided, and that sufficient ammonic hydrate be added to render the solution distinctly alkaline. As a test for the presence of salicylic acid, ferric chloride is exceedingly characteristic and delicate, this salt striking an intense blue color even in very dilute solutions of the acid.

Pharmaceutic uses of salicylic acid are few. It is a powerful antiferment, and of use pharmaceutically in the preservation of syrups, since it prevents or retards the growth of the yeast-cells and cryptogamic plants common to fermenting liquids. It need hardly be said that it should not be used in syrups which may afterwards be dispensed in connection with ferric solutions.

Pharmaceutical Preparations.—Probably that most commonly prescribed is the solution. This may be made by dissolving the acid in boiling water and allowing the solution to cool, and decanting it from the excess of crystals employed. This solution is of necessity weak, and where a stronger solution is desirable we would recommend, where alcohol is objectionable for internal administration, the use of a small quantity of ammonic citrate as a solvent. When a solution is desired for external use, as an antiferment and antiseptic dressing for wounds, etc., a preferable solvent is a small quantity of sodic sulphite, which is non-irritating, and increases the antiseptic properties of the acid.

Ammonic hydrate is suggested by some as an appropriate solvent. This we cannot indorse, as its use is simply to form ammonic salicylate, thereby probably lessening very materially its therapeutic value. We note this special objection, that salicylic acid retards the decomposition of organic matter until sufficient ammonia is formed to neutralize the acid, when ordinary decomposition, and even the multiplication of yeast-cells, proceeds with rapidity.

As a rule to be followed generally, no neutral or alkaline salts should be used as solvents, for though we do not know what may be the chemical action of such salts upon the acid, yet, to say the least, the employment of the various recommended saline solvents is very questionable, as salicylates are most probably formed.

A favorite method of prescription is the pill form. In making these no borax, sodic phosphate, or similar salts should be used. The best excipient is glucose or glycerin, preferably the former.

Lozenges of salicylic acid are frequently prescribed. These may be prepared by mixing with a suitable quantity of sugar, and

making the mass with mucilage of tragacanth, rolling out, and cutting as usual.

Medical Uses.—Regarding these, what can we say with the voluminous literature of the current year before us? Doctors disagree is an old saying, current from the time of the Ptolemies and the famous medical schools of Alexandria. One eminent practitioner notes 170 cases of typhoid fever, in which salicylic acid decreased the temperature in the ratio of 2 to 1 as compared with quinine sulphate; while another notes, with the same fidelity, 208 cases under the same circumstances, atmospheric conditions probably excepted, and finds it vastly inferior. The same may be said of acute rheumatism, small-pox, and other diseases in which it has been used. This part of the subject may safely therefore be left in the hands of the physicians, trusting errors may be corrected, and the surrounding conditions under which cases are noted be so simplified that the opinions of the profession on this interesting substance may be more harmonious.

With pharmacists there is little use for salicylic acid beyond preventing the growth of the vegetable-cells of the *mycoderma*, *torula*, *mucor*, *saccharomyces*, *aspergilla*, etc., with which their syrups may be troubled, or the prevention of the evolution of the *monads*, *bacteria*, *vibrios*, or other infusoria, causing the decomposition of the solutions of albuminoid matters, which from time to time they may wish to preserve.

PHILADELPHIA, July, 1877.

THE EFFECTS OF SALTS UPON THE SOLUBILITY OF SALICYLIC ACID.*

BY DAVID HAYS, NEW YORK.

QUERY 20.—Several salts have been recommended to increase the solubility of Salicylic acid in water; it is desirable to know whether any chemical change is produced thereby; an essay upon the subject, with investigations into nature of such changes.

As the query relates to a subject on which very much has been written, I do not propose to take up any of your valuable time in rehearsing the long array of statements *pro* and *con*, but subjoin

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* Read at the Fifth Session.

a list of experiments, which have been conducted with all due care, and ask that the writer be excused, as lack of time and opportunity has prevented further examination into this very interesting subject.

The following salts were selected as types of the many solvents now in use, the writer not having time to investigate the entire list.

Phosphate of soda was the first salt examined; this, when dried, is capable of dissolving half its weight of salicylic acid, the crystals, which contain a larger proportion of water, dissolving proportionally less. ℥j phosph. soda, and ℥ss. acid salicylic, were dissolved in water, solution filtered, cautiously evaporated, and set aside to cool; a dirty cream-colored mass was left, which, after removal of mother liquor, and dried, was found to consist of minute, white, shining crystals, which were subjected to the following test:

1st. Dissolved a small quantity of crystals in water, and added a few drops of ferric chloride; a fine violet coloration was produced, which rapidly disappeared, and a whitish-yellow precipitate of ferric phosphate was formed, indicating the presence of both salts.

It now became necessary to determine whether the acid existed combined with soda, as a salicylate, in the free state, or as a double salt of phosphosalicylate of soda. Accordingly the following experiments were instituted, and from the facts obtained the value of the analysis depends:

1st. Salicylic acid, when heated upon platinum foil, deflagrates, and at a higher temperature entirely volatilizes.

2d. Salicylate soda, when treated in a similar manner, also deflagrates, the acid volatilizing and leaving a charred mass, which, upon addition of water and filtration, yields a solution very alkaline to test-paper.

3d. Addition of phosphoric acid (H_3PO_4) to an aqueous solution of salicylate of soda, gives a crystalline ppt. of salicylic acid.

4th. Addition of phosphoric acid to an alcoholic solution of salicyl. soda, gives a slight turbidity soluble in excess of phosphoric acid.

5th. The *in*solubility of phosphate of soda in alcohol.

6th. Salicylic acid and the soda salt are both very soluble in alcohol.

7th. The solubility of salicylate of soda in water, and the comparative insolubility of salicylic acid in that liquid.

Bearing these facts in mind, we will now proceed to the actual analysis.

1st. A given quantity of the crystals, resulting from the evaporation of the solution of salicylic acid by aid of phosp. soda, were shaken with alcohol in a test-tube; they partially dissolved, and yielded a cloudy solution, with formation of transparent crystals upon the side of tube; after violent agitation, the alcohol was poured off and more added, in small portions at a time, until a drop placed upon a watch crystal failed to leave a residue. After draining the tube water was added; the crystals dissolved at once, yielding a clear solution. This solution was tested as follows:

(*a.*) Ferric chloride (Fe_2Cl_6) gave a whitish-yellow precipitate, soluble in hydrochloric acid, but *no* coloration.

(*b.*) Molybdate of ammonia gave a characteristic yellow crystalline precipitate of phosphomolybdate of ammonia.

(*c.*) Magnesia sulphate mixed with ammonic chloride was added to solution, and then ammonic hydrate added in excess, giving a white crystalline precipitate of ammonio-phosphate magnesia, thus proving that the watery solution contained the phosphate of soda.

The alcoholic solution was next tested, with the following results:

(*a.*) Addition of ferric chloride gave a fine violet coloration, but *no ppt.*

(*b.*) Phosphoric acid produced a turbidity, soluble in excess of phosp. acid.

A portion was evaporated and set aside. Upon cooling, crystals (needles) were deposited, and an amorphous mass was left. The contents of the dish were well washed with water, and the solution poured off from the undissolved portion and filtered.

(*a.*) Addition of phosphoric acid produced a crystalline, needle-like precipitate, which dissolved upon neutralization of phosp. acid.

(*b.*) Some of the solution was evaporated. Upon cooling an amorphous mass (no crystals) resulted.

(*c.*) Some of this salt, dissolved in alcohol, gave with phosp. acid a turbidity soluble in excess of acid.

(*d.*) A small portion of salt was heated upon a piece of platinum foil, *the mass melted, deflagrated, and a charred mass remained; this, upon treatment with water, gave a solution which was very alkaline to test-paper.*

(*e.*) Ferric chloride added to an aqueous solution of mass, gave characteristic reaction for a salicylate. These results would seem to indicate that salicylate of soda was formed.

The undissolved portion mentioned in (*b*) was now treated with alcohol; solution was immediately effected.

(*a.*) Small portion evaporated upon a watch-glass, gave characteristic needle-like crystals; these were insoluble in water, but soluble in solution of alkalies or alkaline salts.

(*b.*) Portion of these crystals heated upon platinum foil; crystals melted, deflagrated, and finally *entirely volatilized.*

(*c.*) Ferric chloride gave fine violet reaction, which would seem to indicate that these crystals were *free* salicylic acid.

These results, if correct, and every possible care has been taken to make them so, show that partial *decomposition takes place*, salicylate of soda being formed; although the entire amount of acid is *not* converted into this salt, as free salicylic acid exists, as heretofore shown.

It becomes very easy to understand this reaction, when it is remembered that ordinary phosphate of soda—hydrodisodic phosphate—possesses the formula Na_2HPO_4, it being really phosphoric acid in which two hydrogen atoms are replaced by two of the monad element, sodium, as shown by diagram:

$$\left.\begin{matrix} Na' \\ Na' \\ H' \end{matrix}\right\} PO_4.$$

Salicylic acid is a monobasic acid, with the formula $H'C_7H_6O_3$; and has only one replaceable hydrogen atom. Now, when salicylic acid is added to a solution of disodic phosphate, the following decomposition must take place:

Disodic phosphate gives up one atom of sodium, which immediately combines with one atom of salicylic acid, forming salicylate of sodium; and liberating in turn one atom of hydrogen, which replaces the monobasic element, sodium, in the phosphate, and converts it into *monosodic* phosphate; while the remaining molecule of salicylic acid remains undisturbed in the solution, as shown by the following formula:

$$\underset{\text{Hydrodisodic orthophosphate.}}{Na'_2HPO_4} + \underset{\text{Salicylic acid.}}{2H'C_7H_5O_3} = \underset{\text{Dihydro-monosodic orthophosphate.}}{Na'H'_2PO_4} + \underset{\text{Sodic salicylate.}}{Na'C_7H_5O_3} + \underset{\text{Free salicylic acid.}}{H'C_7H_5O_3}.$$

It had been formerly supposed that no decomposition took place,

from the fact that when phosphoric acid was dropped into a solution of salicylic acid prepared by aid of sodic phosphate, a crystalline precipitate of salicylic acid resulted, and hence it was argued that decomposition could not take place; for, if it should, there would result free phosphoric acid in solution, which would decompose any salicylate of soda produced, with precipitation of salicylic acid. But one can readily see by the above reaction that no free phosphoric acid is liberated. The phosphate of soda changing in composition, merely from a state of *hydrodisodic phosphate* to a *dihydro-monosodic phosphate*, which is conveniently proved by its ready solubility in water, and its *acid* reaction to test-paper; disodic phosphate having an *alkaline* reaction.

The next salt experimented upon was ammonic phosphate. I will not rehearse the long array of experiments, but simply add the more prominent ones.

Salicylic acid was dissolved by aid of this salt in water; solution filtered, evaporated, set aside to crystallize; crystals drained from the mother liquor, dried and washed with alcohol, (*a*) part soluble in alcohol.

H_3PO_4 gave a copious ppt., soluble in excess.

A portion boiled with caustic soda gave strong odor of ammonia; and a piece of reddened litmus held at the mouth of the tube was immediately changed to a blue color.

Ferric chloride gave fine violet coloration.

A portion of alcoholic solution evaporated, a semi-crystalline mass obtained, which, upon addition of water, partially dissolved; the aqueous solution was poured off, and hydrochloric acid added; a crystalline precipitate of salicylic acid resulted at once; the liquid was poured upon a filter, and crystals drained; the filtrate gave fine reaction with perchloride of platinum; a heavy yellow crystalline precipitate, of double chloride of platinum and ammonium, proved this portion to be salicylate of ammonium.

The crystals which remained upon removal of part soluble in water, were, by appropriate tests, found to consist of free salicylic acid; (*b*) part soluble in water. Analysis proved these crystals to be a phosphate of ammonia.

The same remarks which were made in regard to the action of phosphate of soda apply to the ammonia salt, free salicylic acid, salicylate of ammonia, and dihydro-monammonic phosphate* existing in the solution.

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* This is commonly known as acid tribasic phosphate.

A salt very much in vogue as a solvent of salicylic acid, is borax. This is a very good solvent, but the solution (as already noticed) becomes bitter upon standing, thereby rendering it unavailable for medicinal use. A curious thing in relation to this is, that upon evaporating such a solution to a syrupy consistence, and allowing to cool, a pasty, transparent mass is obtained, which resembles in appearance the pill excipient of glycerin and powd. gum arabic. Upon allowing this to further evaporate in the air, the mass dries, and shrinks into an oddly contorted shape, looking like a grain of popped corn, and consisting of minute shining crystals, possessing a *very bitter* taste.

Time did not permit an analysis into this compound.

When salicylic acid is dissolved by carbonates, decomposition ensues, accompanied by evolution of carbon dioxide, or formation of a salicylate of the base employed.

I annex a few experiments with regard to preservative action of salicylic acid in combination and in the free state.

To several bottles, the contents of which consisted of decoct. althææ, the following salts were added:

No. 1. ℥ij decoct., 2 grs. salicylate of soda in solution.

No. 2. ℥ij decoct. Nothing added.

No. 3. ℥ij decoct. 2 grs. salicylic acid dissolved by 4 grains of phosphate of ammonia.

No. 4. ℥ij decoct. 2 grs. acid dissolved by 4 grains phosphate of soda.

No. 5. ℥ij decoct. ½ grain salicylic acid.

No. 6. ℥ij decoct. 30 m. alcohol.

This was on August 14th. They were examined every day.

Aug. 15th, Nos. 2 and 6, turbid, smell spoiled. No. 1 begins to have an odor, but better than 2.

Aug. 16th they stood as follows:

No. 1. Bad, offensive.

No. 2. Worse.

No. 3. Better than No. 1.

No. 4. Same as No. 1.

No. 5. Sweet and good.

No. 6. Nearly as bad as No. 2.

Aug. 17th. They stand best, 5, 3, 4 and 1 alike; 6, 2.

Experiments were made with yeast and meat-broth in a similar manner, and from all the results the following is deducted:

Of all the solvents that were recommended alcohol is the best.

Liq. ammonii acetatis next.

Phosp. ammonia next.

Phosp. soda poorest.

It may seem strange that any difference should occur in the action of these salts, phosphate soda and phosp. ammonia. It is explained by the fact that salicylate of ammonia may be more readily decomposed by acids generated during fermentation than the soda salt, and consequently free salicylic acid being produced, the fermentation is thereby retarded.

I hope that these experiments will throw some light upon the action of salicylic acid.

New York, September 3d. 1877.

MINUTES

OF THE

TWENTY-FIFTH ANNUAL MEETING.

First Session.—Tuesday, September 4th.

The twenty-fifth annual meeting of the American Pharmaceutical Association convened in the council chamber of the City Hall, in Toronto, Ontario, Canada, on the afternoon of Tuesday, September 4th. The late arrival of the steamer from Niagara River delayed the opening of the session until near 4 o'clock, when a quorum being present, President Charles Bullock called the meeting to order; John M. Maisch, Secretary. Alderman Wright, of the city of Toronto, appeared in behalf of his worship, the mayor, and addressed the Association as follows:

Mr. President, Gentlemen, and Ladies: It affords me much pleasure to welcome you to the city of Toronto, and to offer to you the use of our council chamber. We have reason to be proud that so august a body as the American Pharmaceutical Association should select the city of Toronto for its annual meeting. We hope that you will make this meeting an occasion of pleasure, so that, when you have left our city, you will carry with you pleasant remembrances of this your twenty-fifth annual meeting.

The President, on behalf of the Association, returned thanks for the kindness shown in granting the use of the council chamber, and then formally opened the meeting by appointing Messrs. R. S. Woodruff, of Connecticut, A. B. Petrie, of Ontario, and E. T. Dobbins, of Philadelphia, a committee to examine the credentials of the delegations. While receiving the credentials, the following letter was handed in and read by the Secretary:

London, August 10th, 1877.

George Hodgett, Esq.,
Registrar Ontario College of Pharmacy.

Dear Sir: I find now it will be next to impossible to return to Canada in time to meet the American Pharmaceutical Association, which will meet in

Toronto the first week in September, and which I much regret. I had hoped to be present on that occasion and to take part in the reception of our American friends, welcome them to our hearts and homes, and to repay in some measure the kindness extended to our members on various occasions. You will please express to one and all of our friends the regret I feel in being unable to meet them, and particularly on this their first meeting on British ground, and that the good feeling now existing may ever continue, and that as a society we may know no East, no West, no North, no South. I hope to hear that all arrangements have been fully carried out, and you all may be benefited, and that you may all experience all the pleasure anticipated. Again regretting the loss I sustain, I remain,

Yours truly,

BENJAMIN LYMAN,
Ex-President Ontario College of Pharmacy.

The President then read the following annual address, which was attentively listened to:

PRESIDENT'S ADDRESS.

GENTLEMEN OF THE AMERICAN PHARMACEUTICAL ASSOCIATION:

The reassembling of the members of an Association after a wide separation and the changes incident to the passage of a year, is always an occasion of interest. We mark the presence of familiar faces; inquiries are made after the absent; and we listen to the announcement of the names to be added to that list which must ever increase.

Our assembling this year is marked with more than usual interest. We will complete the first quarter of a century of our annals, and for the first time in the history of the Association we meet outside of the boundaries of the United States.

Whatever may have been contemplated by the most sanguine of the fathers of this Association, who met in New York, in October, 1851, it is doubtful whether it was foreshadowed to any of them the growth and activity of the body which was then and there conceived. If any are present with us today who attended that meeting, they will find material for reflection in the fact that the Association now numbers over 1000 active and 20 honorary members, and that in this year of grace, 1877, we meet under the folds of the "Cross of St. George."

On a continent so rich and varied in the products of nature which can be utilized medicinally, it seems eminently proper that active membership in the Association should be confined within no geographical boundary, but be coextensive with the English tongue.

The disciple of Æsculapius plays an humble part in the great drama of human progress when viewed only as the "knight of the pestle and the mortar," but when possessed of congenial tastes, and educated to his profession, the narrow arena of the shop expands, covering the face of nature. Botany, chemistry, and mineralogy are sciences with which his calling is

intimately connected, and if a careful observer in any of these departments, he adds to the stock of knowledge which marks human progress.

The shop of the apothecary is oftentimes the school where the mind is trained to observation, tastes developed, and original investigations pursued, which result in giving to science a name to be enrolled among her worthy votaries, and results which often outlive the name of the discoverer.

Sertürner, the discoverer of morphia, in 1804, was an apothecary of Eimbeck, in Hanover, and Dr. Johann Christian Poggendorff, the noted physicist, whose decease was noted in January last, commenced his career as an apprentice to an apothecary.

A knowledge of remedies, wherewith to combat pain and disease, was one of the early necessities of mankind. "It was the offspring of necessity, instinct, and empiricism," and *may* date back to the time of

> "Man's first disobedience, and the fruit
> Of that forbidden tree, whose mortal taste
> Brought death into the world and all our woe."

It is interesting to notice that the date assigned to the papyrus manuscript, discovered by Ebers, and which is said to establish the existence of written formulas among the medical priesthood of Egypt, is the same century in which a preponderance of evidence places the exodus of the Hebrews (the sixteenth century B.C.).*

In the exodus from Egypt, the Hebrew race doubtless carried with them a primitive knowledge of the healing art and an acquaintance with the rude pharmacy practiced by the Egyptian priesthood.

The Hebrew word which has been translated apothecary occurs first in the book of Exodus, then in Nehemiah and Ecclesiastes. In Exodus it is always used in reference to the preparation of an anointing oil, a perfume, or an ointment, called also a confection, used by the Aaronic priesthood in their ministrations. With the Hebrews, ointments were an important feature in medical treatment, as well as in their ritual observances and funeral rites. The term confectioner is at times used in the Old Testament as synonymous with apothecary, and the work, we are told, was sometimes carried on by women. (1 Sam. 8 : 13.)

It would seem natural that attention should have been early directed to the vegetable kingdom in search of medicinal remedies. Those of an aromatic or balsamic character attracted early attention, and are mentioned to some extent in sacred history.

The ancient Greeks extended their observations to botany, as well as to the medicinal character of plants.

Theophrastus, a native of Eresos, in the island of Lesbos, who died 287 B.C., is regarded as the parent of botany. Attalus III, King of Pergamos, an ancient Greek colonial city in Asia Minor (134 B.C.), after the commission of many atrocities, resigned the cares of government, and devoted his attention to the cultivation of plants, giving special attention to those of a poisonous character. He afterwards directed his attention to working in

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* Smith's "Dictionary of the Bible."

metals, and originated several pharmaceutical preparations. Among them is said to be the "ointment of Ceruse," white lead.

In the early part of the first century the science of botany received a new impulse from the labor of Dioscorides. He travelled through Asia Minor, Greece, and Italy, and described and named more than 5000 plants. He is said to be the first writer who exposed frauds in the preparation of medicines.

From Greece medical art was introduced into Rome, about 200 B.C. Among the ancient Romans pharmacy has left a record in Menecrates II, a physician in the reign of Tiberius, A.D. 47. He originated several preparations. Among them is said to have been diachylon, or lead plaster. Galen makes mention of him, and speaks of several of his preparations.

Galen was educated at Alexandria, where pharmacy had been a distinct branch of medical science for three centuries. Driven from Rome by the jealousy of the medical profession, on account of the celebrity he acquired by his skill as a physician, he travelled through various countries investigating the productions of nature. Materia Medica and pharmacy were objects of his particular attention. His name has come down to our own time in connection with preparations termed "Galenical," in distinction to those of a chemical character from mineral or metallic substances.

Egypt was the nursery of art and science. From thence a knowledge of the technical arts extended to India, and from beyond the Indus it returned to the banks of the Tigris and the Nile, "and was cultivated with an ardor which gave lustre in subsequent ages to the schools of Bagdad and Alexandria."

Although pharmacy was instituted a distinct department of medical study in Alexandria, towards the beginning of the fourth century B.C., it was not until the time of Dioscorides that it took such shape as to direct investigations methodically.

For the more full development of pharmacy we are indebted to the Arabs. In his "Cosmos," Baron Humboldt remarks: "The science of medicine founded by Dioscorides, in the school of Alexandria, when considered with reference to its scientific development, is essentially a creation of the Arabs, to whom the oldest, and at the same time, one of the richest sources of knowledge, that of the Indian physician, had been early opened. Chemical pharmacy was created by the Arabs, whilst to them are likewise due the first officinal prescriptions, regarding the preparation and admixture of different remedial agents, the dispensing recipes of the present day. These were subsequently diffused over Southern Europe by the school of Salerno. Pharmacy and Materia Medica, the *first* requirements of practical medicine, led simultaneously in two directions—to the study of botany and to that of chemistry. From its narrow sphere of utility, and its limited application, botany gradually opened a wider and a freer field, comprehending investigations into the structure of organic tissues and their connection with vital forces, and into the laws by which vegetable forms are associated into families and may be distinguished geographically, according to diversities of climate and difference of elevation above the earth's surface."*

* Humboldt's "Cosmos," v. ii, 581.

Alchemy—the parent of chemistry—"was the daughter of astrology, and ceased to be purely religious, and began an independent existence during the third and fourth centuries" A.D. The Greeks living in Egypt during the fifth century appear to have been industrious laborers in this art, "the sickly but imaginative infancy of modern chemistry." After their invasion of Northern Africa and Southern Europe, the Arabs disseminated a knowledge of the art, and it is to them that we are indebted for the development of this branch of science, which, out of its *ignis fatuus* pursuit, developed the means whereby the storehouse of nature was, in after years, made to yield its treasures for the wants of man and for his increasing civilization.

"In their fruitless endeavors to transmute the common metals into gold, the alchemists set in motion the two most powerful springs of action, the love of life and the love of wealth, which impelled them in the search of new processes and combinations that could not have been supplied by any other motive."*

Geber, who was a Greek by birth, and lived towards the close of the eighth century, was the founder of the school of Arabian chemistry. "He was acquainted with the process of distillation, by which he purified vinegar, and applied the term *spirit* to sulphur, arsenic, and other volatile solids." By subjecting to distillation a mixture of sulphate of iron, nitre, and alum, he prepared what he called dissolving water. He was acquainted with crude sal-ammoniac and used it with his dissolving water for liquefying gold. Soda, potash, and alum were known to him. He made corrosive sublimate, cinnabar, and red precipitate, and prepared precipitated sulphur by dissolving sulphur in caustic alkali, and pouring distilled vinegar into the solution.

From A.D. 750 to 1258 the Caliphate of Bagdad, in the East, and Cordova, in the West, were the great centres of learning. The first public "Apotheca" was founded in Bagdad by the Caliph Almansor, A.D. 754. "Under the genial protection of the Caliphate, learning of every kind flourished; the sciences to which the Arabs devoted their principal attention were those connected with the healing art. They labored incessantly to discover the effects upon the human frame not only of plants which gave promise of medicinal efficacy, but they also explored with great eagerness the almost unopened mine of chemistry. The success which attended their rude attempts in the healing art led them to suppose that behind the curtain which veiled the secrets of nature must be concealed remedies of greater and universal power, able to drive pain, disease, and death from the earth."†

The Arabian apothecaries of the twelfth century were under the direction of the government, and subject to strict supervision in regard both to quality and price of medicines. A pharmacopœia, published by Abul Hassan, was their standard of authority.

At Cordova, in Spain, the Saracens contended with their brethren in the East in pursuit of alchemic knowledge. The first notice we have of alcohol comes from Abulcasis, an Arabian physician, who was born near Cordova, and deceased A.D. 1110.

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* "Chemistry," by D. B. Smith. † Id.

Arnaldus Villanovanus, of Naples, an eminent physician of his time, between A.D. 1235 and 1312, was educated in Paris, and travelled through Spain. He was a writer on medicine, alchemy, and religion. Some authorities consider him as the first writer who gives a distinct notice of the knowledge of alcohol. Raymond Lully, in speaking of him, calls him his master.

Raymond Lully, who was born in Barcelona, or according to other accounts in Majorca, in A.D. 1235, and deceased in Algeria in 1315, was a man of neglected education, and led a dissolute life until the age of 30 years. He then renounced the world, bestowed his goods upon the poor, and devoted himself to science, philosophy, and religion.

At the advanced age of 80, while on his return from a pilgrimage to Jerusalem, he fell a victim to popular fury on account of his supposed enmity to the religion of the prophet. Lully concentrated alcohol, and prepared a volatile alkali by destructive distillation from the horns of the stag, from which originated the name spirits of hartshorn.

The history of the life and times of Paracelsus, A.D. 1493 to 1541, is interesting more on account of his persistent attempts to introduce chemical substances into medicine, and his denunciation of Galen and his works, which he publicly burned, than from any discoveries made by him advancing chemical knowledge.

With a knowledge of sulphuric and nitric acids, the alkalies, and the processes of distillation and sublimation, chemistry was supplied with the great implements requisite for complete development. One, however, was wanting; this was supplied by the researches of John Rudolph Glauber, a physician of Amsterdam, who lived between the years A.D. 1604 and 1648. Glauber appears to have cherished dreams of the transmutation of metals. His investigations, although barren of a *golden* harvest to himself, have enriched succeeding generations, and his writings have added practical information to the literature of the laboratory. He was the first to prepare hydrochloric acid. He also examined the medicinal properties of the resulting sulphate of soda, which he called "Sal mirabilis," but much better known, under the name of its distinguished discoverer, as "Glauber's salt." Glauber was also the author of an improved method for obtaining nitric acid by means of sulphuric acid; he also recorded some practical observations on the construction of laboratory furnaces.

The Arabs made an early movement towards decoration in the shops where medicine was sold. In the Castellani collection of antiquities exhibited at the Centennial Exposition, among the ceramics were fine specimens of jars, vases, etc., for pharmaceutical use, made by the Arabs during their residence in Sicily, in the sixteenth and seventeenth centuries.

Besides scenic representations and pharmaceutical mottoes, some bore the name of the pharmacy, and some the family name. A few were inscribed with the name of some article which they were supposed to contain.

A desire to investigate the medicinal properties of chemical products has been a great stimulus to the practical development of chemical science.

The discovery of alcohol enabled pharmacy to dispense in a great measure with the honeys, syrups, and confections of early times; also to obtain the active principles of many medicinal substances.

The discovery of glycerin by Scheele was an important addition to the knowledge of the constitution of fats and oils, afterwards so brilliantly elucidated by the labors of Chevreul. It remained, however, to our own times to appreciate the value of glycerin in pharmacy.

An unexhausted mine has been opened by the products obtained in the distillation of coal. Pharmacy as well as the arts, has been greatly enriched by the investigations which have been made in this almost protean field of labor.

Some of the products obtained by the fractional distillation of petroleum oil are also valuable to the pharmacist, and are well worthy of a more careful and extended observation. The properties of benzin as a ready solvent for fatty matter, while but few crystalline principles or resin are taken up by it, open a field for future investigations. Attention has already been called to this menstruum as a means for the ready separation of oleic acid, as also for obtaining the essential oils from many substances. This cheap product may hereafter play an important part in the laboratory of the chemist and pharmacist.

Commercial enterprise has been always a promoter of knowledge. From the time when the "Ishmaelites came from Gilead bearing spicery and balm and myrrh, going to carry it down into Egypt," until the present day, when explorations of the Amazon and Orinoco are giving to the Materia Medica many new and valuable additions, commercial enterprise seeks for a utilization of discovery.

It has been remarked "that pharmacy is becoming too mercantile;" but is she more so than the spirit of the age compels? Her pills and elixirs and new preparations are indeed pressed upon the devouring millions, who are ready to receive them; but under the rule of the stern examiner *experience*, they will be sifted down to their proper place, and the "survival" will be to "the fittest."

The business affairs of the Association have received careful attention from the various committees to whom they have been intrusted. The volume of Proceedings for 1876 will compare favorably with preceding volumes. Great credit is due to the Permanent Secretary, and to the Reporter on the Progress of Pharmacy, for the completeness which has marked their work.

The committee to whom was referred the subject of a report on the exhibit at the Centennial Exhibition presented a report covering 130 pages. It is perhaps the most complete report on this class of exhibits which can be found.

The thanks of the Association are due to this committee for their extended and arduous labors. To the chairman of this committee especially we are indebted for the judgment and labor necessary in arranging and compiling the work of the committee.

A resolution offered by Mr. Eberle to amend the by-laws which relate to the expulsion of a member, was not acted on at the last meeting. The subject will come up for your consideration as postponed business. As hasty action in such cases is to be deprecated, I recommend to your consideration the propriety of the proposed change.

The committee on the Ebert prize will also recommend a change, which selects from the queries those which are to be the subject of competition, and

in case no competition is accepted, or if accepted and not found of sufficient merit, then the selection is to be made from among all the papers offered.

The subject of the proposed change in the proprietary right and manner of revision of the United States Pharmacopœia, will claim your attention at the present meeting.

The American Medical Association, who by the proposed change were to be invested with the right, title, and control of the work, have taken a conservative view of the subject, and have not seen their way clear for the radical change recommended.

If we exclude from consideration a change in the copyright of the book, and continue it in the hands of the convention especially charged with this work alone, the modifications recommended in the revision can be carried into effect, and many of them will meet with the approval of pharmacists.

The local committee appointed in Philadelphia last year to arrange for the entertainment of the members of the Association, had a small balance remaining after the closing of their accounts. They unanimously decided to increase the amount by subscription to $500. The sum thus collected they propose to present to the Association, under the condition that a similar amount be subscribed by members of the Association; the whole to form a fund to be permanently invested, and the interest to be placed at the disposal of a committee specially appointed for the purpose (or the Executive Committee), to be used in assisting members in the prosecution of original investigations. I would earnestly recommend the subject to your favorable consideration. If each member of the Association will contribute one dollar, a fund sufficient will be at once secured to aid many of our members in the pursuit of investigation, who are now deterred by reason of the cost of material and appliances.

In retiring from the position of executive officer of the Association, I thank you for the honor which you have conferred upon me. The harmony which has marked our proceedings has made the duties of your president light and agreeable.

I am much impressed with the extent of the field of usefulness open to this Association. In the sharp competition for business which marks our age, some fostering and directing influence seems necessary for the interest of pharmaceutical progress. As a conservator of such interest this Association has my best wishes, and will have my cordial support.

On motion of Mr. Sheppard it was voted, Mr. Tufts taking the question, that the thanks of the Association be presented to the President for his able and interesting address, and that it be referred to a committee of three to report on the suggestions contained therein.

An invitation was received from Messrs. Gooderham & Worts to visit their extensive and well-appointed distillery, and was accepted with thanks, the Secretary being instructed to acknowledge the receipt.

Mr. Wellcome, acting in place of the chairman of the Business

Committee, who was not present, moved that Professor Henry Croft, and the other members of the faculty of the University of Toronto, who may feel interested in our proceedings, be invited to take seats. On motion of Mr. Markoe, the medical profession of the city of Toronto were likewise invited.

Mr. A. W. Miller presented the following communication:

To the American Pharmaceutical Association.

Gentlemen: The joint committee of the American Pharmaceutical Association and of the Philadelphia College of Pharmacy, composed of pharmacists of Philadelphia and vicinity, and appointed to provide for the proper entertainment of the members of the Association at the last meeting, decided to present an unexpended balance remaining in their hands, together with a sum of money subsequently collected, to the Association, with a view of establishing a fund to aid in the prosecution of original investigations.

This total amount of five hundred and twenty-five dollars is hereby presented to the American Pharmaceutical Association, with this condition, that a like amount be subscribed by the members for the same purpose within one year from the date of the acceptance of this fund by the Association.

The joint committee desire to suggest that the Executive Committee securely invest this total amount, and carefully devote the interest accruing from the investment to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy, which may ultimately prove to be of service to the members generally, and lastly, that the name under which this fund shall be known hereafter, be (in honor of the year of its establishment) "The Centennial Fund."

The joint committee trusts that this action may meet with your approbation, and that it may result in advancing the cause in which we are mutually interested.

Respectfully submitted,

Adolph W. Miller,

Secretary.

At the close of the communication, Mr. Miller handed to the Treasurer a check for $525, and on motion of Mr. Sheppard, amended by Mr. Menninger, it was resolved that the communication be accepted and referred to the Committee on the President's Address, which committee was appointed as follows: Messrs. E. P. Nichols, of New Jersey; J. Ingalls, of Georgia; and T. J. Casper, of Ohio.

Mr. Bedford read Sec. 4, Art. II, Chap. VIII, of the By-Laws, and then said:

It has been usual heretofore that all business was suspended until the Committee on Credentials had reported the names of delegates. Three years ago this was altered, so that the President's address might be read while this

committee were examining the credentials and attending to their duty. They are kept out of the room usually for an hour or more, and we are now waiting for this committee to return. I rise to suggest, not with a view of bringing up a discussion, which seems hardly necessary, but rather to draw out the views of the members as to whether we shall depart from the custom or shall make an alteration of the by-laws by which that committee shall be appointed and may hand in its report at the next session. That would give them all the evening to attend to their duty without calling them out of the room while other business is being transacted, and it also gives an opportunity for other delegates to present their credentials and have them all acted upon at the second session of the meeting.

THE SECRETARY.—If the credentials had all been here at the opening hour the work of the committee would have been very easy, but they come in one by one, and for that reason the committee is kept at work. However, the Committee on Credentials will have to report at the first session, because the Nominating Committee cannot be appointed until after the report has been received. There are also a number of delegates who join by virtue of their being delegates, and it would be unjust to deprive those new members of a vote for a longer time than is necessary. The provision of the by-laws alluded to is therefore, in my opinion, a very wise one, although it may cost us perhaps a few minutes by waiting for the committee, unless this committee could make up the report before the opening of the first session.

Mr. Woodruff read the following report of the Committee on Credentials:

We find upon examination the following gentlemen hold proper credentials as delegates to the Twenty-fifth Annual Meeting of the American Pharmaceutical Association, held at Toronto, commencing September 4th, 1877:

Ontario College of Pharmacy.—William Elliot, Neil C. Love, Hugh Miller, George J. Waugh, George Hodgetts.

Connecticut Pharmaceutical Association.—Alonzo F. Wood, Luzerne J. Munson, Roderick S. Woodruff, John K. Williams, Romanta Wells.

New Jersey Pharmaceutical Association.—Edward P. Nichols, Aaron S. White, William Henry Sayre, Robert W. Gardner, Robert J. Shaw.

King's County Pharmaceutical Association, Brooklyn, N. Y.—Edward A. Sayre, George A. Newman, J. O. Barnaby, Charles Althans, Foxwell C. Culls, Jr.

Louisville College of Pharmacy.—C. Lewis Diehl, Edward C. Pfingst, W. W. Smith, Vincent Davis, Emil Scheffer.

Richmond Pharmaceutical Association, Richmond, Va.—T. Roberts Baker, John B. Purcell, Hugh Blair, Joseph Anthony, Benjamin C. Lewis.

Georgia Pharmaceutical Association.—John Ingalls, Homer P. Tarrant, Alexander A. Menard.

Massachusetts College of Pharmacy.—Charles P. Orne, William S. Folger, George F. H. Markoe, Ashel Boyden, Augustus R. Bailey.

Newark Pharmaceutical Association, N. J.—Edward P. Nichols, Ransford W. Vandervoort, Charles Holzhauer, William H. Stamford, Patrick J. Garrigan.

New Hampshire Pharmaceutical Association.—Charles A. Tufts, Charles F. Hildreth, Elias S. Russell, Benjamin F. Rackley, Henry B. Foster.

National College of Pharmacy, Washington, D. C.—Robert B. Ferguson, William S. Thompson, Oscar Oldberg, A. M. Read, John A. Milburn.

College of Pharmacy of the City of New York.—Charles Rice, Frederick Hoffmann, Henry J. Menninger, Moses L. M. Peixotto, Adolph Tscheppe.

Literary and Scientific Society of the German Apothecaries of the City of New York.—Charles Eimer, Adolph Tscheppe, Paul Balluff, Frederick A. Reichardt, Gustavus Ramsperger.

Alumni Association of the Massachusetts College of Pharmacy.—Samuel A. D. Sheppard, Charles A. Tufts, Thomas Doliber, Charles P. Orne, William W. Bartlett.

Alumni Association of the Philadelphia College of Pharmacy.—Lewis Shaw, Charles A. Weideman, Edward C. Jones, Charles L. Eberle, Richard V. Mattison.

Maryland College of Pharmacy.—Louis Dohme, John F. Hancock, Joseph Roberts, Ferdinand Hassenkamp, Edwin Eareckson.

New York Alumni Association of the Philadelphia College of Pharmacy.—Henry S. Wellcome, J. Messing, Jr.

Alumni Association of the College of Pharmacy of the City of New York.—P. Wendover Bedford, Thomas F. Main, Charles Robbins.

Philadelphia College of Pharmacy.—W. H. Pile, A. W. Miller, G. W. Kennedy, W. McIntyre, A. P. Brown.

Rhode Island Pharmaceutical Association.—A. L. Calder.

All of which is respectfully submitted.

R. S. Woodruff,
E. T. Dobbins,
A. B. Petrie.

The report of the committee was, on motion, accepted, and the gentlemen accredited admitted as delegates, after which the Secretary called the roll, over eighty members answering to their names.

The following committee reports were handed in and laid upon the table for future action: Report of the Executive Committee, with report of the Secretary, and reports of the Committees on the Drug Market, on Papers and Queries, on Prize Essays, on Legislation, on Adulterations and Sophistications, and on the Centennial Exhibition. No reports had been handed in from the Committees on Maximum Doses and on Metric Weights and Measures.

The Nominating Committee was appointed by each delegation present designating one of its members to serve on that committee, as follows:

Ontario College of Pharmacy,	George J. Waugh.
Louisville College of Pharmacy,	C. L. Diehl.
Massachusetts College of Pharmacy,	G. F. H. Markoe.
National College of Pharmacy, Washington,	J. A. Milburn.
New York College of Pharmacy,	M. L. M. Peixotto.
Maryland College of Pharmacy,	Edwin Eareckson.
Philadelphia College of Pharmacy,	William McIntyre.
Connecticut Pharmaceutical Association,	L. J. Munson.
New Jersey Pharmaceutical Association,	R. J. Shaw.
Georgia Pharmaceutical Association,	H. P. Tarrant.
New Hampshire Pharmaceutical Association,	Charles A. Tufts.
Rhode Island Pharmaceutical Association,	A. L. Calder.
King's County Pharmaceutical Association,	E. A. Sayre.
Richmond Pharmaceutical Association,	T. R. Baker.
Newark Pharmaceutical Association,	Charles Holzhauer.
Literary and Scientific Society of German Apothecaries of New York,	Adolph Tscheppe.
Alumni Association of the Massachusetts College of Pharmacy,	S. A. D. Sheppard.
Alumni Association of the Philadelphia College of Pharmacy,	R. V. Mattison.
New York Alumni Association of the Philadelphia College of Pharmacy,	H. S. Wellcome.
Alumni Association of the New York College of Pharmacy,	T. F. Main.

On motion of the Secretary, Messrs. A. E. Ebert and Th. Ronnefeld were added to the Committee, the former to represent the Chicago College of Pharmacy, the latter the Michigan Pharmaceutical Association, from both of which bodies credentials had been expected to arrive before the opening of the meeting.

The name of Mr. E. H. Heinitsh was, on motion of Mr. Sheppard, likewise added, as the representative of the South Carolina Pharmaceutical Association.

In compliance with the by-laws, the chair added five members, not delegates, from the Association at large, as follows: Edmund Gregory, Ontario; Z. James Belt, Delaware; Jacob A. Miller, Pennsylvania; William Neergaard and Alfred S. Lane, New York.

Mr. Kennedy read the report of the Executive Committee, as follows:

To the Officers and Members of the American Pharmaceutical Association.

Gentlemen: In conformity with requirements of the By-laws of our Association, the Executive Committee would most respectfully present at this session their annual report.

The twenty-fourth volume of the Proceedings of your Association was issued early in the month of January, about the same time as last year.

It is the largest volume yet issued by the Association, containing several more pages than the one preceding it, which was the largest up to that time. Your committee considered it necessary, in order to keep the book within convenient size, to use smaller type, as, no doubt, you have observed the change. It is hoped by your committee it will be satisfactory to all, as it saves several hundred pages of space. Altogether the volume will be found to contain useful and interesting reading. Of its 909 pages, not unlike its predecessors, a considerable portion is taken up by the excellent report of Prof. Diehl, on the Progress of Pharmacy, which occupies 392 pages, and the reports of different committees by 48 pages; these are followed by original papers read at the meeting, which take up 120 pages; the balance is occupied by the minutes, discussions, the President's address, Constitution and By-laws, roll of members, and index, and for the first time an alphabetical list of members. The report of the Committee on Centennial Exhibition is very lengthy, and furnishes a nearly complete list of medicinal articles displayed. Beside the above, a well-executed lithographic plate of thirteen vesicating beetles, very correct plates of Eryodyction Californicum, and Rheum officinale, and fifty woodcuts in illustration of drugs, chemicals, apparatus, etc., make the work a very valuable one; the price of the book has been fixed by your committee at $7.50.

The early publication of last Proceedings is due principally to our worthy Permanent Secretary, who worked hard with a view to an early issue of the same, and to the promptness with which nearly all the papers and reports were handed to the editor.

No one can form an idea as to the extent of labor in publishing the Proceedings, excepting those who have had experience in that kind of work. I certainly should be derelict of duty, were I not to report the advantages to the Association, and more especially your committee, in having so able and efficient a stenographer as our friend Mr. Slade, who has served the Association faithfully for the last twelve years.

As was intimated in my last report, the likeness of our deceased member, John Milhau, was issued with the last volume of Proceedings; the steel plate engraving was obtained from the family of deceased at a reduced rate, fourteen hundred pictures were made, the total expense to the Association amounting to $61.55; the portrait is an excellent one, and is readily recognized as our deceased friend, who labored hard for the promotion and the advancement of pharmacy. Your committee have already completed arrangements to adorn the next Proceedings with the picture of Charles T. Carney, of Boston, Mass. The deceased was well known to the older members of the Association, who look upon him with feelings of pride; those who knew him honored

his abilities, and loved him for his many gentlemanly qualities. In looking back over the Proceedings, you will find his name prominently as a worker in our cause; he served on many committees, and discharged the duties as such in a commendable manner. A brief obituary notice of him will be found in the Proceedings of 1863.

I have the pleasure again to report a large increase of membership at our last meeting, although not quite so large as at Boston, in 1875, but still when we take into consideration the stagnant condition of business and the great depression in financial matters, we have every reason to congratulate ourselves upon our success.

REPORT OF MEMBERSHIP.

Number of members in good standing at last report, . . .		1066
Number of new members elected at last meeting, ...	117	
Number of delegates who became members by signing the Constitution, ...	31	
Total new membership, ...		148
And making a total membership, ...		1214

LOSS IN MEMBERSHIP.

By resignation, ...	5	
Dropped from roll for various causes, ...	32	
By death, ...	13	
Total loss, ...		50
Leaving a balance in membership in good standing at this report of .		1164

There still remains an honorary membership of 20.

It is highly gratifying to me to be able to make such a pleasing report as to membership. We have every cause to feel encouraged with our progressiveness. Our membership has been steadily and rapidly increasing within the past few years, with a comparatively small loss by death and other causes. Our financial condition is tolerably fair, when compared with former years, although in this respect there is room for improvement, of course, as in the past. We are able to meet our obligations, but after liquidating our indebtedness, we have but a small balance left. It seems to me, after a score and a quarter of years, we should not only be able to meet our liabilities, but have a considerable amount stored away in a sinking fund. I notice by the Thirteenth Annual Report of the British Pharmaceutical Conference, that in the last two years the Treasurer reports a surplus of £430 or $2150 over and above their annual expenses, and our Association, being about as old again, only with a very small balance, comparatively speaking, in the hands of our Treasurer. I regret exceedingly our financial exhibit is not more encouraging. One of the great drawbacks to our organization is to be found in the stipulations of the old Constitution, by which members who had paid their annual

contributions for ten consecutive years should be considered life members, and exempt from further yearly payments, while still enjoying all the privileges of full members. The old Constitution had fixed the annual contribution at but $2, making the total amount paid in ten years $20, to become a life member.

Our Society has a large field to work in, and as there are a great many intelligent pharmacists who are not members of our organization, and who would be a credit to it, I hope our members will exert themselves with a view of still increasing our strength. We can hardly expect a large addition to our ranks at this time, but after business improves, and confidence is once more restored in financial affairs, let each of us go to work and bring in our new members.

Our worthy Treasurer, friend Tufts, in his last annual message, reports a balance of $941. That amount of balance may appear large to some of our members, but the Executive Committeee find it a small amount to meet the expenses incurred in issuing the Proceedings; in fact, it is hardly sufficient to commence with. As will be observed by the Treasurer's report, it requires about $5000 annually to meet the current expenses of the Association. I desire to call the attention of the Association to the fact that a number of persons who connect themselves with our organization, after paying the initiation fee and one year's dues, forget the annual contribution thereafter, and hang on to the Association, sometimes receiving the Proceedings for two, three, or more years, until they are dropped for non-payment of dues. I hope, gentlemen, you will bear this in mind, and try to keep such unworthy persons from connecting themselves with our organization. In looking over the list of those dropped from the roll, I find about 75 per cent. of them are new members.

Your chairman would again call the attention of the members to the following, which I have had occasion to call your attention to before:

1st. That all applications be forwarded to the Chairman of the Executive Committee at least one week prior to the meeting.

2d. That in addition to the required signatures, each application should have *the name of the applicant in full*, either printed or legibly written in some conspicuous place, containing also the street and number of house.

3d. The application should be accompanied by the requisite funds if the applicant is not likely to be present at the meeting.

4th. That all answers to queries, volunteer papers, and reports, when presented and read at the meeting, be completed and ready for the editor without further delay.

5th. That authors of papers turn over to the Secretary a list of preparations exhibited in connection therewith, and a sketch of such illustrations as may be desirable.

6th. Your chairman would ask you to notify him of the demise of any of our members at your earliest opportunity, and if convenient, to furnish him with a brief biographical sketch.

The Executive Committee, to facilitate and expedite the business at and after the annual meetings, have thought proper, on account of its convenience, to print a form of credentials, which the various associations sending delegates

are requested hereafter to use. Copies can be had from Prof. Maisch, the Permanent Secretary.

The applications for membership, with their respective vouchers attached thereto, which have thus far been received have been regularly filed, and will be reported for election at the proper time.

If there are any members present who have not supplied themselves with the badge of our Association, adopted at our last meeting in Philadelphia, for their information I would say they can be obtained from our Permanent Secretary at the nominal sum of fifty cents. It is hoped that each member will procure one.

Before closing my report, I have the solemn duty yet to perform of announcing, with short biographical sketches, the demise of thirteen members, quite a number of whom were taken away without a moment's notice. Some of the departed we were well acquainted with, having met them at our annual reunions.

So far as your chairman has been able to ascertain, the following is a list of members who have died since my last report:

Alexander King,	Buffalo, N. Y.
Bernard H. Reinold,	New York City.
C. W. Badger,	Newark, N. J.
William G. Schmidt,	Louisville, Ky.
Henry A. Hughes,	Louisville, Ky.
C. E. Eyster,	Duluth, Minn.
William J. Bertolett,	Shreve, O.
Gustavus Mallinckrodt,	St. Louis, Mo.
C. H. Atwood,	Boston, Mass.
Max Frohwein,	New York City.
George M. Howard,	Washington, D. C.
George W. Aimar,	Charleston, S. C.
Henry C. Porter,	Towanda, Pa.

Alexander King, of Buffalo, N. Y., died at Canandaigua, N. Y., September 10th, 1876, aged twenty-five years. Mr. King was born in Jersey City, July, 1851. His father, the Rev. David King, was pastor of the old Wall Street Church of New York city, and died when Alexander was but three years of age. His mother soon followed his father in death, leaving him an orphan. He was reared by his father's parents, and educated at the Canandaigua Academy. When fourteen years of age he commenced the study of pharmacy with his uncle, William King, Jr., an old and well-known drug house of Buffalo, continuing in his employ until 1872, when he began his studies at the Philadelphia College of Pharmacy, where he graduated in a very creditable manner in March, 1874. In the fall of the same year he connected himself with our Association at Louisville, Ky. After graduating, he returned at once to the employ of his uncle, and remained with him until a few months prior to his death, when his rapidly failing health compelled him to seek rest and a change. He returned to his former home, but quickly sank beneath that fatal disease, consumption. In Buffalo, and in his own home,

Mr. King was highly esteemed, and his ability as a pharmacist commanded for him much respect. In college he enjoyed the highest regards of his classmates, who can bear tribute to his estimable qualities.

Bernard H. Reinold, of New York city, died there in October, 1876, in the fiftieth year of his age. Mr. Reinold was born in Volkmarsen, Germany, in the year 1827, began the study of pharmacy when quite young, and graduated at Jena, after acquiring a regular pharmaceutical education. Deceased came to this country in the year 1855, and located and established himself in business as a chemist and pharmacist in the city of New York. Mr. Reinold was well known, and stood high as a pharmacist among the fraternity and with all those with whom he came in contact. He was beloved and respected by all who knew him as a conscientious and reliable apothecary. He was a member of the German Apothecaries' Society of the City of New York, and for a number of years its President, and for a long time identified with the College of Pharmacy of the City of New York, in which he took a lively interest both as a member and officer, he being at the time of his death one of its Vice-Presidents. Deceased was elected a member of our Association in 1861.

Charles W. Badger, a life member under the new by-laws, died at Newark, New Jersey, January 17th, 1877, in the sixty-third year of his age. Mr. Badger was born, April 1st, 1814, at Middletown, Connecticut. When quite an infant, the family moved to Wethersfield, at which place he began the study of pharmacy, at the early age of thirteen, with Dr. Erastus Cook, where he remained five years, under whose excellent instruction he had advantages which few young men have. As Dr. Cook was a thorough chemist and apothecary, his clerks were obliged to study certain hours each day and to become good Latin scholars. Such training as this was fitting Mr. Badger to engage in the profession he had chosen with credit to himself and a benefit to others. At the age of eighteen he left Dr. Cook and went to New York, making his first start in life under the care of Rushton & Aspinwall, with whom he remained three years. In 1835, having arrived at the age of twenty-one, and seeing a good prospect for business in Newark, New Jersey, he left New York and formed a copartnership with a Mr. White. Three years later, owing to Mr. White's ill-health, he sold his entire interest to Mr. Badger, who conducted and enlarged the business for over twenty-five years. In order that he might have less of the cares of a confining business, in 1867 he associated with him Mr. C. B. Smith, a former clerk, under the firm name of C. W. Badger & Co. At the expiration of three years he sold all his interest in the drug business to Mr. Smith, and spent the remainder of his days attending to his own rapidly increasing private business. Mr. Badger was foremost in the work of organizing the New Jersey and Newark Pharmaceutical Societies. Attending the meetings faithfully, active in every project that looked to the advancement of the same, steadfast in upholding the dignity of our profession, unyielding in his opposition to all forms of trickery or deceit. Being of a retiring disposition and shrinking from publicity, the deceased was comparatively little known outside of the city of Newark, where he resided for over forty years, but among the business men he was esteemed as a man of strict integrity, good judgment, a wise counsellor, and a friend of the oppressed.

He held important positions in the boards of several financial institutions. The New Jersey and Newark Pharmaceutical Associations held meetings for the purpose of drawing up resolutions, expressive of their regret at the loss of so valuable a member. On the day of the funeral, between the hours of 2 and 4 P.M., all the drug stores in the city of Newark were closed out of respect to the memory of deceased. Mr. Badger became a member of our Association at Baltimore, in 1870.

William G. Schmidt was born in Hernkirchen, Electorate of Hesse, September 19th, 1840, where he received his early education. In 1855 he emigrated to this country and took up his residence in Cincinnati, where he had two brothers, one a physician and the other a pharmacist. Selecting pharmacy as a profession, he entered the drug house of Allen & Co., afterwards accepted a situation with Thomas Schœch, of Louisville, Kentucky, but again returned to Cincinnati, where he passed several years in the establishment of Mr. Adolphus Fennel (now Professor of Pharmacy in the Cincinnati College of Pharmacy), under whose training he acquired the substantial knowledge necessary to his career. In 1861 he enlisted in the Ninth Ohio Volunteers as hospital steward, and went with this regiment through the arduous campaign in Western Virginia. After his discharge, in 1862, he was for some time with the house of H. H. Hill & Co., Cincinnati. His brother Albert, who had succeeded Mr. Schœch, of Louisville, was compelled by reason of ill-health to visit Europe. The deceased took charge of his brother's business, and when the latter died, in August, 1863, conducted the same on his own account until he was also called from his earthly labor. By his energy, ability, and courtesy, he was considered by those well acquainted with him one of the most popular and successful pharmacists in the city of Louisville, and at his death had accumulated a competency for his family, consisting of a wife and three children. Mr. Schmidt was one of the founders of the Louisville College of Pharmacy, and one of its most active and valued members. It was through him that the Louisville College of Pharmacy was enabled at a very early date of its institution to open a course of lectures, and continue the same successfully. He was one of the directors of the college from the date of its organization, and its Corresponding Secretary since 1871. He was also chairman of the Executive Committee during several sessions, and chairman of the Trustees of the Building Fund, in which capacity he was instrumental in raising the greater part of the present fund. These trusts were imposed upon him because he was characteristically prompt, conscientious in discharging all his duties, and because he took great pride in furthering the interests of the college and pharmacy in general. He had just completed his report as chairman of the Trustees of the Building Fund due on the following day, and while on his way to the secretary of the Board of Trustees, to whose inspection he desired to submit his report, the symptoms of the disease, congestion of the brain, first made themselves manifest, which ended his life a few hours thereafter, on January 11th, 1877. He became a member of our Association at the Louisville meeting, in 1874.

Henry Arnold Hughes, a life member of our Association, died very suddenly in Louisville, Ky., November 21st, 1876, of congestion of the brain, in the

fifty-fifth year of his age. Deceased was born in Paris, Bourbon County, Kentucky, June 25th, 1821. He engaged in the retail drug business in 1847, in Louisville, and continued in it with uninterrupted success until 1851, when, having sold his retail establishment, he formed a copartnership with J. E. Sutcliffe and Thomas K. McAllister, under the firm style of Sutcliffe, McAllister & Co., for the purpose of conducting the wholesale drug business; in one year after Mr. McAllister withdrew from the firm, when it was changed to Sutcliffe & Hughes. The business was prosecuted with unbroken success until the 1st of January, 1860, when Mr. Hughes's connection with Dr. Sutcliffe was severed. In 1846, Mr. Hughes married Miss Mildred A. Kellar, who, with two sons and a daughter, survives him. Mr. Hughes was, at the time of his death, the oldest member of our Association from Kentucky, having joined the Association during the interim of 1856 and 1857. The later years of his life were spent in seclusion, but he always felt a lively interest in his favorite profession of pharmacy, and noted with pleasure the rapid advances of the last few years.

Christian Edward Eyster, died in Duluth, Minnesota, Nov. 13th, 1876, aged twenty-nine years, after a brief illness. He began the study of pharmacy at the age of seventeen, with Mr. Charles H. Cressler, in his native town, Chambersburg, Pa., and remained in his employ several years, after which he removed to Philadelphia, for the purpose of attending lectures at the Philadelphia College of Pharmacy, from which institution he graduated in the spring of 1869. In 1870 he embarked in business in Duluth, Minnesota, where he continued until the date of his death. His social qualities, upright and enterprising business, and uniform unblemished life, render his untimely death a sad affliction to his family, and a loss to the business he so creditably represented. Mr. Eyster was elected a member of our Association at St. Louis, in 1871.

Gustavus Mallinckrodt died of consumption, on the morning of June 5th, 1877, at Denver, Colorado. He was born at St. Louis, Sept. 27th, 1840, being at the time of his death in the thirty-seventh year of his age. At the early age of sixteen he began the study of pharmacy with Richardson & Co., of St. Louis, remaining with them six years. In 1862 he joined the army, becoming adjutant to General Asboth. Afterwards he was appointed paymaster, in which capacity he remained till the spring of 1864, when he returned to St. Louis, and again connected himself with Richardson & Co. In the fall of 1867, he associated himself with his younger brothers, Edward and Otto, for the purpose of manufacturing chemicals, establishing the well-known house of G. Mallinckrodt & Co., of St. Louis, the marked success of which was largely due to his able and energetic management. Mr. Mallinckrodt became a member of the Association in 1869, at Chicago, Ill. He was Chairman of the Local Committee of Arrangements for the meeting of the Association at St. Louis, in 1872. His health began to fail several years ago, but though repeatedly urged to desist from business, he continued to apply himself with unrelenting energy until the fall of 1874; from that time until his death he was a constant traveller, going from one place to another, in the vain search for a climate that would restore his health. The deceased

was well known and highly respected by the leading druggists throughout the West, and a large portion of the South. He was a thoughtful, devoted, and faithful son, a generous and loving brother, a true and sympathizing friend. His amiable disposition, social qualities, great intelligence, and strict integrity, won him a host of friends.

Dr. William J. Bertolett, of Shreve, Ohio, died there quite suddenly, on the 5th of June last, aged forty-eight years. Dr. Bertolett was born at Spring Forge, Berks County, Pa., Sept. 17th, 1828. When twelve years old his father, Dr. D. K. Bertolett, removed from Spring Forge to Washingtonville, Columbiana County, Ohio. The deceased was educated at Cannonsburg, Pa., of which college he was a graduate, and in mathematical and classical attainments stood very high. His medical education was obtained under the tuition of his father, who enjoyed an excellent reputation as a physician, and at the medical department of the University of Pennsylvania, of which he was a graduate. In 1853, he married Miss Catharine A. Greenault, of Washingtonville, and soon after went to Centreville, Wayne County, and commenced the practice of surgery and medicine. After two years he went to Shreve, Ohio, where he resided up to the time of his death, continuously engaged in the practice of his profession until six years ago, when, by reason of his rapidly failing health, he retired from practice and engaged in the drug business, in which he continued until the time of his death. The deceased was, by natural ability and educational acquirements, eminently fitted for the vocation of his choice; his life was characterized by the most indefatigable industry. He leaves a wife and three sons to mourn his untimely fate. Deceased became a member of our organization at Cleveland, Ohio, in 1872.

Charles Henry Atwood, a life member of our Association, died in Boston, Mass., May 12th, 1877, aged fifty-nine years. Mr. Atwood was born at Plymouth, April 21st, 1818. At the age of seventeen he commenced the study of pharmacy at Boston with Dr. Daniel Henchman, and continued in his employ during his apprenticeship. Deceased began business for himself in 1841, corner Harrison Avenue and Beach Street; married the only daughter of Mr. Thomas Simpson, of Boston, in 1843; removed in 1844 to Green, corner of Leverett Street, having purchased the store of Mr. James Fowle, and in 1858 established himself in the wholesale business on Central Street. Mr. Atwood was a chemist, of strict integrity in all his business relations, much beloved and respected by all who knew him, and was regarded as one of the best apothecaries in his State by those best acquainted with him. He possessed a large and generous heart, and gave a large portion of his income away for charitable purposes. Mr. Atwood was an invalid for several years, and leaves a widow and a son to mourn the loss of a devoted husband and father. His membership dates back from 1856.

Dr. George W. Aimar died at Charleston, S. C., July 19th, 1877, of myelitis, in the fiftieth year of his age. He was born in Charleston, S. C., on the 4th of October, 1827. After receiving a fair education, he, in 1846, entered the drug store of Dr. Cunningham, a prominent druggist of Beaufort, S. C.,

remaining there about one year. Returning to Charleston, he served as clerk until 1853, when he went into business on his own account, establishing himself at the corner of Vanderhorst and King Streets, at which place he had been doing business for nearly a quarter of a century. Dr. Aimar was a gentleman of culture and exquisite sensibilities; affable and courteous in his intercourse with his fellow-man, he won and retained the esteem of all who came in contact with him. His unobtrusive charities and unbounded hospitality, his even temper and generous nature, his honest dealings in his business relations, inspired an affection for him which is not given many men to enjoy. He became a member of our Association at Louisville, Ky., in 1874.

Max Frohwein died in New York city, May 3d, 1877, of pneumonia, aged thirty-eight years. The deceased was born at Atzmannsdorf, Thuringia, February 7th, 1839, came to this country in 1860, and learned the apothecary business with his brother in New York. In 1865 he graduated from the New York College of Pharmacy; and shortly after began business for himself at the corner of Rivington and Columbia Streets. In business he was very successful, highly esteemed as a pharmacist, and a conscientious, upright man. He was a member of the New York College of Pharmacy and of the Alumni Association. In 1865 he was elected a member of our Association at Boston, Mass.

Dr. George Montgomrie Howard died in the city of Washington, D. C., on the 14th of July, 1877, of phthisis pulmonalis. He was a native of Glasgow, Scotland, where he was educated at the Royal College, passed his examination at Edinburgh, and entered the British army for the Crimean war as an assistant surgeon. He came to this country in 1863, and during the following year he engaged in the drug business in Washington City, D. C., by purchasing the half interest in a store of which he eventually became the sole proprietor, and where he continued until his death. He was a charter member of the National College of Pharmacy, and evinced considerable interest in organizing its school. The deceased connected himself with our Society in 1871 at the St. Louis meeting.

Henry C. Porter, of Towanda, Pa., died there quite recently. His connection with our Association dates back to 1869, at the Chicago meeting.

The above report embraces everything of note that your chairman thought would be of sufficient importance to speak of.

In concluding his report, he wishes to return his thanks to the Permanent Secretary and all other officers and members of the Association who rendered him valuable assistance whenever called upon.

Yours, etc.,

George W. Kennedy,
Chairman Executive Committee.

Pottsville, Pa., August 31st, 1877.

Mr. William Elliot, President of the Ontario College of Pharmacy, addressed the Association as follows:

In anticipation of the visit of this Association, most members of the Ontario College of Pharmacy felt a desire that they might have an opportunity of so-

cial intercourse beyond simply meeting with you at these business meetings, and they have therefore thought it desirable and feasible that we should have some entertainment on some evening during your stay in the city. I merely rise for the purpose of presenting an invitation, not merely to the gentlemen of the American Pharmaceutical Association, but also to the ladies accompanying them, to an entertainment which we propose to hold to-morrow evening in the Educational building, commonly called in this city the Normal School. I would also throw out the idea that it would be very desirable to be punctual. I think we have a programme that will occupy us as late as will be desirable. The chair will be taken punctually at eight o'clock. I will give a rough idea of what the proceedings will be. First of all, there will be a short address from either the acting Minister of Education for this Province, or the assistant minister, an address of welcome to the buildings, because the buildings are the property of the Ontario government, and they very kindly loan them to us for that occasion. Next will be a few words of welcome from myself, and then it is proposed that some gentleman you may appoint, your President or any one else, should make a brief reply; we don't intend to have long speeches. Then we propose to have a short time occupied as a concert, some singing and some music. The first part will occupy about an hour. After that there will be an opportunity to promenade through the building and examine the paintings, statuary, philosophic apparatus, and other collections, of which there is a respectable amount in the building. A scientific gentleman will be present who will give microscopic and spectroscopic exhibitions. That will occupy about two hours. In the meantime refreshments will be served. We don't promise any champagne, for we are strongly temperate in Toronto. In the shape of drinks we promise tea, coffee, and perhaps lemonade. Then there will be a second short concert in what is called the theatre, or examination room, and afterwards if any gentlemen feel talkative under the influence of the lemonade, there may be a few short volunteer speeches. I trust the evening will be pleasantly occupied. I hope every gentleman and lady will meet us on that occasion. Of course the membership of our Association is very much scattered over this Province of Ontario, but we hope to have a goodly number present. At any rate, we feel confident every one connected with the science of pharmacy, living in the city, will be present, and we hope for a pleasant gathering.

The Secretary stated that a printed programme had been placed upon his desk, containing the representation of a camping scene on the borders of a lake, and extending the following invitation:

Arrangements have been made with the Northern Railway Company, for a cheap excursion to the Muskoka Lakes, at the close of the meeting of the Association.

From their scenery and surroundings, they have been designated the picturesque portion of Canada.

Trains leave Toronto at 7 A.M., and after a pleasant ride of 115 miles, Gravenhurst is reached, where steamer is taken through Lakes Muskoka and

Rousseau, returning by Lake Joseph ; at several points of which passengers may make a pleasurable stay for fishing, etc.

The fare has been reduced to five dollars for the round trip. Hotel fare at Rousseau, $1.50 per day.

The junior pharmacists of Toronto request the pleasure of your company in camp at Sparrow Lake, to spend a few days under canvas. Leaving the city at 7 A.M., Saturday, 8th inst., via Northern Railway, to Severn Bridge, where boats will be in waiting to convey the party to the camping-ground. A supply of fishing tackle will be provided, and it is hoped that two or three days may be agreeably spent in botanizing, geologizing, piscatorializing, etc.

To such as may be strangers to a Canadian camp life, it would only be fair to give an idea of the hardships to be encountered, lest our visitors might be disappointed.

Firstly.—No feather-beds or mattresses, but two blankets, and plenty of cedar brush ; this can hardly be called a hardship, because it makes a soft bed.

Secondly.—No sofas or chairs, but very firm seats may be secured, in fact are already secured, free of charge. The rocks are very hard.

Thirdly.—Pabulum, not what might be called first-class hotel fare, but three meals a day, will be selected from the following :

INFUS. ADDENDA.

Dec. Caffeæ, Lacto et Sacch.,
Inf. Theæ, "
Rasuræ Porci,
Solanum Tuberosum,
Querquedula Ferox,
Tetrao Umbellus,
Numenius Aquata,
Trinza Variosa,
Perca Fluvialis,
" Labrax,
Esox Lucius,
Panis,
Biscocti, etc.

And other dishes, to be gathered from the forest and streams, depending to a large extent on our own activity and skill.

These are the hardships.

In place of dessert, you are expected to take in the surrounding scenery, as being more digestible. It is not essential to open the mouth for this purpose.

Campers leave the railway at Severn Bridge. Fare for the round trip, $3.00.

N.B.—Committee must have acceptances by Wednesday at noon at latest, to make arrangements.

No. 2. N.B.—Smoking allowed.

On motion of Mr. Markoe, it was voted that thanks be tendered to the Ontario College of Pharmacy for the invitation to the reception at the Normal School, and also to the committee who had presented so attractive a programme to enable the members to get some idea of camp life in Canada.

The Permanent Secretary then read the following report:

REPORT OF THE PERMANENT SECRETARY.

To the Chairman of the Executive Committee:

The last volume of the Proceedings was distributed about the same time as the one preceding it, and furnished to all members whom the Treasurer reported to be not in arrears with their annual contributions, and to the delinquents as soon as information was received that the arrearages had been paid. In getting up the volume, the Association is indebted to the family of our late president, John Milhau, for contributing one-half the expense of the excellent steel engraving; to our fellow-member William Saunders, for the execution, at his own expense, of the lithographic plate of blistering beetles; to the "Chicago Pharmacist," for the loan of two, and to the "American Journal of Pharmacy" for the loan of nineteen woodcuts, which were used for illustrating the last volume. The Association is also indebted to the Committee on the Centennial Exhibition, for their promptness in getting up a nearly complete catalogue of the articles possessing pharmaceutical interest, which were displayed at the last World's Fair. The Secretary desires to call attention to the fact that this special catalogue is by far more perfect than the one officially published, and that its judicious arrangement leaves little to desire if the short time is taken into account which was left to the committee for arranging the material and preparing for the printer.

The publishing expenses for the last volume of Proceedings were as follows:

Phonographic Report,	$238 50
Woodcuts,	69 05
Steel engraving,	61 55
Printing of Lithographic Plate,	28 00
Composition and Printing,	2373 56
Binding,	357 29
Journals for use of Reporter on Progress of Pharmacy,	56 27
Salaries of Reporter and Secretary,	1100 00
Incidental Expenses of the Secretary,	285 27
Total,	$4569 49

This sum is exclusive of the salary and incidental expenses of the Treasurer. Upon the Treasurer's report the total incidental expenses of the Secretary will

appear in the sum of $317.69, which includes $32.42 paid for journals; the remaining sum accounted for above was paid for the following items:

Telegrams,	$1 65
Packing-boxes, etc.,	14 50
Freight and expressage,	103 12
Postage stamps,	136 50
Circulars and Stationery,	29 50
	$285 27

The expenses for freight and postage stamps, by far the largest portion of which is incurred in distributing the Proceedings, amounts to $239.62, a saving of nearly $57, as compared with last year.

The aim of the Executive Committee for a number of years past has been to print the Proceedings only in sufficient number for the wants of the members and for the exchanges, and if all members would pay their dues regularly, but few copies would annually be left over; the neglect of some to provide for the payment of their dues causes the stock of the Proceedings, as stored in the building of the Philadelphia College of Pharmacy, to become larger every year, while but few copies of the older volumes are sold, others being furnished to delinquent members as they settle their accounts, or to the libraries of new pharmaceutical associations. The stock on hand is as follows:

1851.	313	in paper.				1865.	154	in paper,	27	bound.
1852.	98	"				1866.	72	"	84	"
1853.	95	"				1867.	152	"	90	"
1854.	68	"				1868.	61	"	154	"
1855.	111	"				1869.	105	"	145	"
1857.	255	"	18	bound.		1870.	114	"	87	"
1858.	57	"	17	"	130 loose.	1871.	99	"	62	"
1859.	—	"	53	"		1872.	96	"	2	"
1860.	—	"	208	"		1873.	22	"	92	"
1862.	—	"	283	"		1874.	133	"	28	"
1863.	—	"	262	"		1875.	69	"	38	"
1864.	183	"	115	"		1876.	47	"	76	"

The insurance on these and the other books belonging to the Association has been continued in the German Fire Insurance Company of Philadelphia, in the sum of $2500, at an annual premium of $17.50.

The sale of badges at the last meeting yielded to our treasury the sum of $65, which is something less than one-half the sum expended for the dies and badges, a considerable number of the latter being still on hand, and more than sufficient, if sold, to reimburse the Association for the outlay, the total of which has been $146.55.

In his official capacity, the Secretary is not unfrequently called upon to furnish the names of the officers of one or more Colleges of Pharmacy or local Pharmaceutical Associations. For such information he is, at present, dependent mainly upon notices in the pharmaceutical journals, and addresses

of the officers of most of these Associations are unknown to him. To enable him furnishing the information indicated, and to facilitate any necessary correspondence between the National Association and the colleges and local societies, the Permanent Secretary would respectfully request the latter that the names and addresses of their presidents and secretaries, when elected, be communicated to him.

The Permanent Secretary desires to call the attention of the Executive Committee and of the Association to a subject which appears to require some notice, though he is not prepared to recommend any particular action. Members who are on the roll as contributors annually receive the Treasurer's bill, and if their dues are not paid, the current volume of Proceedings is withheld from them. It is different with those who have acquired life membership under the provisions of the old Constitution; the Treasurer has no occasion to correspond with those members, nor has the Secretary, except to send them the copy of the Proceedings to which they are entitled by virtue of their life membership. The difficulties which may arise are best stated by relating the following occurrences: A life member moved to one of the larger cities, and received the Proceedings for three or four years, through the authorized agent of the Association, but could subsequently not be found, and was reported "unknown" for three successive years; in the fourth year, the Executive Committee decided to drop his name from the roll, but before it was done the Secretary received a letter in which the member stated that he had been out of the drug business for a number of years, but intending to soon enter it again, claimed the Proceedings, which were sent, and since that time no further information has been received. Another life member living in a large city sold his business, and moved to some place unknown to the authorized agent, the Treasurer, and Secretary; his successor in business had received the Proceedings for two years before the removal became known to the officers. A third life member, who until a few years ago, was the only member of the Association in his town, has moved West some three or four years since; in the meantime, the Proceedings have been mailed or sent by express to his former address, and were, doubtless, received by his successor. According to a resolution passed at the fourteenth annual meeting (Proceedings, 1866, p. 66), the Association does not hold itself responsible for the loss of Proceedings which may occur in consequence of removal, of which the Permanent Secretary has not been notified. But it is not so much the possible loss of Proceedings that should be taken into consideration, as rather the question whether the Executive Committee be justified in dropping from the roll a life member of whose whereabouts they have not had any knowledge for a period of several years, or whether the names must be carried on the roll until, perchance, it be ascertained whether they are living or dead?

Another subject has been on the mind of the Permanent Secretary for some time; but it is one which he broaches only with reluctance, knowing full well that on former occasions its discussion has taken up much valuable time; yet the subject appears to be important enough to demand the attention of the Association, if a committee, after weighing the question in all its bearings, could agree upon a plan, equitable alike to the Association and its members.

It is well known that the old Constitution contained a provision according to which the payment of ten annual dues made a member exempt from the further payment of dues, and he became a life member, having all the rights and privileges of the contributing members. With the increase of the usefulness of the Association, it was found impossible to continue this course, and in 1868 the provision was abolished, to date from the close of that meeting, and members elected in that year would become life members after paying the dues for the present year. All the members who had acquired that right to life membership were requested to give it up for the benefit of the Association; but while many have relinquished it, others declined or reserved for themselves this right, in the meantime continuing to pay the annual contribution until further notice. In 1870, life membership was restored, but was made dependent on the payment of $75 in one sum. It was then hoped that a number of members would avail themselves of the opportunity of aiding the Association in carrying out its objects, and accordingly it was ordered that the fees obtained from this source should be invested, and the annual interest only used for the current expenses of the Association This hope was not realized, the Association having had only one life member under that clause, the late Charles W. Badger, of Newark, N. J. Now it seems but correct that the policy of the Association should be to retain its members, and more particularly those who have been connected with it for many years, and after being advanced in years, may be unable to actively participate in its proceedings, but still retain a justifiable interest in the progress of the profession of their choice. Such, it would seem, might be accomplished by a commutation of the dues and life membership fee in such a manner that a certain allowance be made for each year for which dues have already been paid; and that the difference between this sum and the $75 be considered the fee for life membership, and be permanently invested for the use of the Association. If such a proposition be entertained, it would involve an amendment to Chapter VI, Article V, of the By-laws. It is believed that a large number of those who are now life members under the old Constitution would pay the difference to become life members under the present laws, seeing as they would that such a contribution would be available for good purposes, even after the close of their earthly labors. But whatever may be thought of these ideas, the Secretary, from his knowledge of the financial affairs of the Association since 1863, would beg to express the hope that life membership be not made the reward for promptly paying the annual dues for any given period, unless that period be made long enough that few members could expect to survive.

In conclusion, the Secretary desires to express his obligations to the members generally for their uniform courtesy, and especially to the officers and the authorized agents, who have cheerfully aided him in his labors.

All of which is respectfully submitted.

JOHN M. MAISCH,
Permanent Secretary.

On motion of Mr. Rice, the reports of the Executive Committee and Permanent Secretary were accepted and referred for publica-

tion, and the suggestions contained therein referred to the Committee on the President's Address for their consideration and report.

The Treasurer's report, though ready, was not in the hall, and its reading was postponed to the second session.

The following Committee to Examine and Report on the Specimens on Exhibition was appointed by the chair: Henry J. Rose, of Toronto; George F. H. Markoe, of Boston; Charles Rice, of New York; T. Roberts Baker, of Richmond; and Albert E. Ebert, of Chicago.

A motion was made that the sessions be held from 9 A.M. to 12, and from 3 to 6 o'clock P.M. daily until the close of the meeting, but after some explanations was withdrawn.

Mr. Menninger moved, and it was carried, that the Association adjourn until to-morrow morning at 9 o'clock.

Adjourned.

Second Session.—Wednesday Forenoon, September 5th.

Shortly after the appointed hour, President Bullock called the meeting to order. The Secretary read the minutes of the first session, which were approved, and then credentials, received this morning, accrediting as delegates for the *Chicago College of Pharmacy*, A. E. Ebert, E. H. Sargent, N. G. Bartlett, James D. Mill, and C. F. Hartwig; and for the *Maine Pharmaceutical Association*, S. D. Wakefield, J. H. Plaisted, W. T. Harlow, H. T. Cummings, and A. R. Bixby. The credentials were, on motion, accepted, and the accredited gentlemen present admitted as delegates.

The report of the Nominating Committee having been placed upon the Secretary's desk, was read as follows:

TORONTO, ONTARIO, September 4th, 1877.

TO THE AMERICAN PHARMACEUTICAL ASSOCIATION:

We submit the following names as nominated by your committee for Officers and the Standing Committees:

For President.

WILLIAM SAUNDERS, ... London, Ont.

For First Vice-President.

EWEN MCINTYRE, ... New York.

For Second Vice-President.

JOHN INGALLS, ... Macon, Ga.

For Third Vice-President.

EMLEN PAINTER, ... San Francisco, Cal.

For Treasurer.

CHARLES A. TUFTS, ... Dover, N. H.

For Permanent Secretary.

JOHN M. MAISCH, ... Philadelphia, Pa.

For Local Secretary.

(Nomination to be made after the selection of the place for next meeting.)

For Reporter on the Progress of Pharmacy.

C. LEWIS DIEHL, ... Louisville, Ky.

For Executive Committee.

GEORGE W. KENNEDY (Chairman), ... Pottsville, Pa.
HOMER P. TARRANT, ... Augusta, Ga.
ALBERT L. CALDER, ... Providence, R. I.
JAMES G. STEELE, ... San Francisco, Cal.
JOHN M. MAISCH, Permanent Secretary, *ex-officio*, . Philadelphia, Pa.

For Committee on Drug Market.

WILLIAM H. WICKHAM (Chairman), ... New York.
T. ROBERTS BAKER, ... Richmond, Va.
SOLOMON CARTER, ... Boston, Mass.
HENRY W. FULLER, ... Chicago, Ill.
CHRISTIAN F. G. MEYER, ... St. Louis, Mo.

For Committee on Papers and Queries.

EDWARD P. NICHOLS (Chairman), ... Newark, N. J.
EDWARD B. SHUTTLEWORTH, ... Toronto, Ont.
MOSES L. M. PEIXOTTO, ... New York.

For Business Committee.

HENRY J. MENNINGER (Chairman), ... Brooklyn, N. Y.
HENRY S. WELLCOME, ... New York.
WILLIAM SIMPSON, ... Raleigh, N. C.

For Committee on Prize Essays.

C. LEWIS DIEHL (Chairman), ... Louisville, Ky.
JOHN F. JUDGE, ... Cincinnati, O.
EMIL SCHEFFER, ... Louisville, Ky.

For Committee on Legislation.

John M. Maisch,	Philadelphia, Pa.
Samuel A. D. Sheppard,	Boston, Mass.
Adolph Pfeiffer,	St. Louis, Mo.

Charles A. Tufts, *Chairman.*
Henry S. Wellcome, *Secretary.*

On motion of Mr. Menninger the report of the committee was accepted, and the President directed to cast an affirmative ballot for the nominee for the office of President. This being done, Messrs. Eberle of Philadelphia and Peixotto of New York, who had been appointed tellers, reported the election of Mr. William Saunders as President for the ensuing year.

Mr. Menninger moved, seconded by Mr. Diehl, that the President be requested to deposit a ballot in favor of the remaining Officers and Standing Committees as nominated. Adopted, and the nominees were declared duly elected.

On motion of Mr. Ebert a committee of two, consisting of Messrs. Diehl and Ebert, was appointed to conduct the President elect to the chair.

Pending the arrival of the new President, the Secretary called up, as unfinished business from the first session, the report of the Executive Committee on the applications for membership. The report was read by the chairman, and Messrs. Eberle and Peixotto, acting as tellers, reported that the vote was not unanimous.

The President.—This will necessitate the taking of the ballot individually or in some other way.

The Secretary.—I would suggest that those gentlemen who have any objection to one or the other of the candidates report to the Executive Committee, so that such names may afterwards be voted upon separately. That is the quickest way to get over the difficulty, and we may vote on the others, against whom there appears to be no personal objection.

After consultation with several members, the Chairman of the Executive Committee withdrew one proposition and presented the following list of candidates for membership, all of whom were duly elected:

California.

C. B. Elbe, Alameda.

Connecticut.

James T. Renouff, Winsted.

Georgia.

John Fale, Hawkinsville.
R. B. Hall, Macon.

Iowa.

Emil L. Boerner, Iowa City.
Olaf Martin Oleson, Fort Dodge.

Maine.

Edmund Dana, Jr., Portland.

Massachusetts.

William C. Brighham, Medford.
Edwin P. Burley, Boston.
John Choate, Fitchburg.
William H. Gray, Springfield.
Daniel H. Howard, Medford.
George H. Stoddard, Boston.

Michigan.

Frank G. Somers, Detroit.

New Hampshire.

Francis C. Miville, Manchester.

New Jersey.

Robert E. Parsons, Orange.
John P. Scherff, Bloomfield.

New York.

Oscar C. Dudley, Brooklyn.
Burt P Gates, Saratoga Springs.
Carroll E. Gates, Saratoga Springs.
William T. Millener, Spencerport.
T. H. Sands Pennington, Saratoga.
Francis Raas, Brooklyn.
Isaac M. Seltzer, New York.

Ohio.

G. R Armstrong, South Charleston.

Pennsylvania.

Thomas P. Cook, Philadelphia.
Joseph S. Evans, West Chester.
Wilhelm E. Lindewald, Philadelphia.

Canada.

John Henderson, Toronto, Ontario.
F. Jordan, Goderich, Ontario.
H. A. Knowles, Toronto, Ontario.
Wm. S. Robinson, Yorkville, Ontario.

The committee appointed to conduct the President elect to the Chair made their appearance, and Mr. Diehl introduced Mr. Saunders to the presiding officer.

President Bullock.—Gentlemen: I have the pleasure of introducing to you your new President; a man whose name is well known to the members of this Association, from the shores of Ontario to the slopes of the Pacific, William Saunders, of London, Ontario.

On taking the chair, Mr. Saunders spoke as follows:

Gentlemen of the American Pharmaceutical Association:

Your action this day in electing me to fill the highest office in your bestowment, is without a precedent in the history of the Association. You meet for this, your twenty-fifth annual gathering, for the first time beyond the boundary of the United States, and now you have taken occasion to elect for the first time in your history, a President who lives beyound the boundaries of your own honored and progressive country, a citizen of the Dominion of Canada, where her Gracious Majesty Queen Victoria, whom, I am sure, you all

honor, holds sway. This is another evidence that pharmacy in America is not fettered by political ties, and heeds not political status; but, that while the members of this Association heartily extend the fraternal hand of greeting and of fellowship to all who join their ranks, they are also ready on occasion to elevate them, regardless of nationality, to the highest positions of honor and trust.

In so kindly responding to the invitation of the Ontario College of Pharmacy in selecting Toronto, the capital of Ontario, as your place of meeting, we feel that you have not only honored the city you have chosen, and this Province, which forms so fair a portion of the Dominion of Canada, but that you have conferred especial honor on the Ontario College of Pharmacy, which I am privileged to represent.

In this election you have laid us under deeper obligations. Personally, I sincerely thank you for the distinguished honor you have conferred on me, and on behalf of the Ontario College of Pharmacy, and the pharmacists of Ontario, whom I represent, I thank you.

The business of the Association, gentlemen, will now claim our attention. There will be many excellent papers presented to you, and subjects of importance to the pharmacist are to be discussed. I trust that all our discussions will be conducted in that charitable and fraternal spirit of tolerance and respect for the opinions of others which has characterized our meetings in the past. We cannot all think alike, and it is fortunate we do not, for it is to these differences of opinion among us that much of our real progress is due. Let each one then weigh well the arguments of those who may differ from him, and evincing a tractable spirit, be ever ready to learn.

I trust you will aid me, gentlemen, in carrying out the business of the Association, by punctuality in attendance. There are many subjects of interest to come before you, and it is my purpose to begin the sessions promptly at the time appointed.

I sincerely hope that this may prove one of the most interesting and profitable occasions you have ever spent together, and that you and your good ladies will carry with you to your homes, pleasant recollections of your visit to Canada. I again thank you for the honor you have conferred upon me.

The suggestion has been made, and I am sure you will all fall in with it most cordially, that it will be well to present the Vice-Presidents of the Association. I have great pleasure in introducing to you Mr. McIntyre, of New York, and Mr. Ingalls, of Georgia.

Mr. Ingalls.—I thank you most cordially, personally, and also on the part of my State, for the kindness you have done me in electing me one of your Vice-Presidents.

Mr. McIntyre.—I also thank you for the honor done me.

Mr. Tufts read the following annual report of the Treasurer:

To the Officers and Members of the American Pharmaceutical Association:

Gentlemen: In conformity with the requirements of the Constitution, I herewith present a report of the transactions of the Treasurer's office for the

past year. All the bills of which I have any knowledge at this time have been paid, and there is a balance to a new account of nine hundred and fifty-four dollars and thirty-nine cents. This sum does not include the Ebert fund, or the amount received for life membership, which is invested, and the interest of which only is used. This balance would have been larger but for the general depression in business. I have received letters from members in many of the States, writing that they would remit in a short time, but could not do so then.

At the last annual meeting one hundred and eighty-nine ex-members of the Association had retained their certificates of membership, in violation of their promises when becoming members of the same. The Treasurer, at that meeting, was directed, by vote of the Association, to demand those certificates. A communication was addressed to each person, and sent to his last known place of residence. Five certificates have been returned, and six have written that certificates were burned with their stores. I have received notice of the death of two others; six cannot find their certificates, and one expects again to become a member of the Association. The letters to forty-three have been returned by the post-offices, and there are one hundred and twenty-six letters from which I have heard nothing.

Upon our list of members we have ninety-one who became life members under the old rule, paying for ten years, and who did not relinquish their life membership. Most of them became so by paying twenty dollars. It cost the Association to keep its promises with these members over five hundred dollars the past year. If those members would be willing to repay to the Association each year the net cost of the Proceedings, it would add very much to its efficiency. We submit these facts to the careful consideration of these members, with the hope that they will act agreeable to our suggestion.

With so many accounts as are now on the Treasurer's books, it is almost impossible but errors will sometimes occur I shall be pleased to adjust at once such errors whenever brought to my notice. When your Secretary and Treasurer entered upon their duties, twelve years ago, their labors were but as pastime to what they are now, and the work is constantly increasing. Familiarity with it, and with the needs of each other, rendered it easier than it would be otherwise; but the members can hardly realize how much of the time of those officers is engrossed by the work of the Association.

The two ledgers used by the Treasurer are so thoroughly filled that all the accounts should be transferred in an abbreviated form to a new one. The Treasurer cannot express his happiness at the prospect before him, but hopes to be well advanced in the work by another meeting. I regret I have not been able to answer all the letters sent me as soon as I could wish, but shall try and do so with as little delay as possible. I have mailed for the Association nearly twenty-five hundred letters during the past year.

I would particularly thank the Permanent Secretary, the Chairman of the Executive Committee, and the accredited agents of the Association, for their kind assistance, and the members generally for our pleasant correspondence during the past year.

Statement of the Receipts and Disbursements of the American Pharmaceutical Association for the year ending September 4th, 1877.

1876.		RECEIPTS.	
Sept.	14.	To balance on hand as per last Report, . . .	$941 33
1877.			
Sept.	1.	To amount received for Contributions, . . .	5225 00
"	"	" " " from the sale of Certificates, .	242 50
"	"	" " " " " Proceedings, .	105 54
			$6514 37

1876.					DISBURSEMENTS.	
Sept.	14.	No.	1.	By cash paid C. Lewis Diehl, Report, . .		$100 00
"	"	"	2.	" " Ig. Kohler, Expenses, . . .		31 60
"	16.	"	3.	" " C. Lewis Diehl, Report, . .		300 00
"	"	"	4.	" " James H. Slade, Phonographic Report, ...		100 00
"	"	"	5.	" " Anthony Morin, Expenses, . .		25 00
Nov.	14.	"	6.	" " C. Lewis Diehl, Report, . .		200 00
Dec.	2.	"	7.	" " James H. Slade, Phonographic Report, ...		138 50
"	10.	"	8.	" " Charles A. Tufts, Expenses, . .		48 50
1877.						
Jan.	22.	"	9.	" " William H. Clark, Proceedings, .		69 05
"	"	"	10.	" " C. F. Scheidemantel, Expenses, .		121 55
Feb.	5.	"	11.	" " Sinclair & Co., Proceedings, . .		28 00
"	"	"	12.	" " John Milhau's Sons, Proceedings, .		61 55
"	"	"	13.	" " John M. Maisch, Expenses, . .		274 06
Mar.	17.	"	14.	" " John M. Maisch, Expenses, . .		126 40
Feb.	26	"	15.	" " Sherman & Co , Proceedings, .		600 00
April	7.	"	16.	" " John M. Maisch, Insurance, . .		17 50
"	17.	"	17.	" " P. Wendover Bedford, Pharmacopœia Committee, . . .		25 00
June	25.	"	18.	" " John M. Maisch, Expenses, . .		200 00
July	10.	"	19.	" " Ig. Kohler, Expenses, . .		23 85
"	20.	"	20.	" " Sherman & Co., Proceedings, .		300 00
"	31.	"	21.	" " William Rutter & Co., Proceedings, ...		200 00
Aug.	8.	"	22.	" " John M. Maisch, Expenses, . .		250 00
"	"	"	23.	" " William Rutter & Co., Proceedings, ...		157 29
"	14.	"	24.	" " Sherman & Co., Proceedings, .		1473 50
"	16.	"	25.	" " John M. Maisch, Expenses, . .		108 58
"	18.	"	26.	" " Charles A. Tufts, " . .		400 00
"	"	"	27.	" " John M. Maisch, " . .		43 63
"	31.	"	28.	" " Charles A. Tufts, " . .		56 40
"	"	"	29.	" " Charles A. Tufts, " . .		80 02
						$5559 98
				Balance to new account, ...		954 39
						$6514 37

E. E. All of which is respectfully submitted.

CHARLES A. TUFTS,
Treasurer.

On motion of Mr. Eberle, the Treasurer's report was accepted, and ordered to be referred to an auditing committee of three.

THE PRESIDENT.—The Chairman of the Committee on Papers and Queries wishes me to offer a word of explanation in regard to the list circulated among the members. The queries on this list, and some additional ones, will all be embraced in the list for next year, provided they are accepted. To prevent two or three accepting the same query, which might well happen among the number that have been circulated, parties wishing to take queries will please consult with the chairman in each case, to see whether the queries have been taken or not.

MR. INGALLS.—If in order, I desire to invite the American Pharmaceutical Association to hold its next meeting in Atlanta.

THE SECRETARY.—I move that this invitation be referred to a committee of three, to be appointed by the Chair, to report on the time and place of the next annual meeting.

The motion was adopted, and Messrs J. P. Remington, T. R. Baker, and A. E. Ebert appointed said committee.

Mr. Diehl read the introductory part of his report on the Progress of Pharmacy for the past year (see page 25). The report was on motion accepted and referred for publication.

THE PRESIDENT.—A memorandum has been handed me suggesting that there are a large number of members who desire to hear from some of our Georgia members, as to the advisability of Northern people visiting the South in summer, and that an opportunity be afforded now for them to give their views on the subject, and whether it would be necessary to make the date later.

MR. INGALLS.—Atlanta is far above any malarial trouble. We regard it as a very fine summer resort. I don't think there would be any risk. I think it is healthier than New York or Philadelphia. It is very accessible, a great railroad centre, and a very enterprising city. I think we could give you a warm Southern welcome.

MR. BAKER.—As you have had the testimony of an interested party, perhaps it will be better to have a little outside testimony. I have never visited Atlanta myself, and cannot speak from my own experience; but I have a friend here, Mr. Campbell, of Portsmouth, who, though not a member of this Association, is an old druggist, and has travelled through that country. He tells me that Atlanta is probably the healthiest part of the South. It is on high ground, in the northwestern part of Georgia, and is considered very healthy indeed. It has a great many other attractions. It is very accessible, and if the Association go there, I am sure they will meet a very hospitable and cordial reception. Not only that, I think if the Association wishes to develop

its resources in the South, that would probably be the best point to do it, for the reason that it can draw from the Gulf States.

Mr. Menninger.—I don't wish to interrupt the gentlemen in their discussion on this subject, but on behalf of the Business Committee I would say this argument ought to be made before the committee on time and place primarily, and when the report comes up this discussion will be more appropriate. I hope the regular business will be continued.

The President.—The suggestion was made with the view of drawing out an expression of opinion to guide the committee.

Mr. Ebert.—It would be quite desirable for the committee to be informed by these gentlemen that are now in the hall. It is very possible some of them would not feel enough interested to hunt up the committee; so if we can spare a few moments it will be quite advisable to hear some remarks in regard to the proposed meeting at Atlanta.

Mr. Heinitsh.—As an old Philadelphian who has been a physician in the South, I can testify as to the correct statements which the gentlemen have made. The South has always been regarded as very unhealthy, and that Northern persons going there subject themselves to the diseases incidental to our section of the country, but I am sure, from my own experience, there would be no danger in Atlanta. It is far up in the mountains, remote from the seaboard. I have visited Atlanta, gone up as far as Memphis and down to New Orleans with perfect impunity in June. Besides this, pharmacy in the South is at a low ebb, and I think if this Association will meet in our Southern country occasionally, it will awaken a deeper interest in all that concerns the advancement of our science. The opportunities for enjoyment with which you have surrounded this Association, and made it so pleasant to visit its Northern meetings, we cannot give in the generous way in which you have bestowed them upon us, but in other respects I think you will find the place a very pleasant one. It is accessible by a number of routes, and I think the trip would be very agreeable.

The Secretary.—I desire to make a few remarks in regard to visiting Atlanta and the State of Georgia during the month of September. I don't know that the Association is bound to hold its annual meeting every year during the month of September. In my opinion the Association might just as well, if it see fit, meet at some other time. Perhaps October might be preferred. I remember very well the arguments that were made in former years against holding the meeting later than the first half of the month of September, namely, that many of the active members were connected with the different colleges, and consequently had to be at home by the first of October. Such argument, in my opinion, does not hold good at the present time, when we have such a large number of working members, and when the professors of the different colleges of pharmacy are so very largely in the minority. Moreover, it should be remembered that from every college of pharmacy in the United States one member of the faculty at least could be spared for a week or two, in order to attend the meetings of the American Pharmaceutical Association, even if it was late in the month of December. So far as the time is

concerned, in my opinion, there would not be the slightest objection to postponing the meeting, if necessary, until after the month of September. In this connection I would state that I hold in my hand a letter from J. D. Wells, inviting the Association to meet next year in Cincinnati (reads letter). I would suggest that this be referred to the same committee. I can hardly abstain from making another remark in regard to the selection of places for holding our annual meetings. It seems to me the Association is now in such a condition that it ought to go to new places rather than to the old ones where it has gone heretofore. If you look at the territory that has been covered by the meetings, you will find that they were all held at the cities on the Atlantic coast, forming a nearly straight line, then on a southern line from Richmond through the Ohio valley, in three cities; then on a northern line along the lakes, and once we met in the valley of the Mississippi. Between these lines there are a number of important places where the Association can go. South of them also and northwest of them are other places of importance. It seems to me that those cities where we have met before have far less claims upon the Association than those where we have never met before.

The invitation from the Cincinnati College of Pharmacy was referred to the committee on the time and place of next meeting.

The chair appointed Messrs. C. L. Eberle, of Pennsylvania, E. Gregory, of Ontario, and W. H. Rogers, of New York, the committee to audit the Treasurer's account.

The Secretary read the following report of the Committee on Prize Essays:

To the American Pharmaceutical Association:

The undersigned committee, having carefully examined the papers presented at the meeting of the American Pharmaceutical Association held at Philadelphia in September last, and printed in the Proceedings, have arrived at the decision that none of the essays offered comes fully within the terms of the stipulations made by the donor, restricting the award "to the best essay or written contribution containing an *original* investigation of a medicinal substance, determining new properties or containing other meritorious contributions to knowledge; or for improved methods of determined merit for the preparation of chemical or pharmacal products."

In view of the apparent difficulty of obtaining, by the present method, original communications of sufficient importance and merit to justify the awarding of a prize, the committee would respectfully suggest the following modification of the present plan, which is believed to give better results, and does not conflict with any of the stipulations in the original grant.

1. The duties of the Committee on Prize Essays shall be twofold, viz.:

a. To select from the queries proposed at any one meeting those a satisfactory reply to which would be a valuable addition to our knowledge, and would be worth competing for. They shall publish these selected questions within four weeks after the annual meeting.

b. To examine and determine the merits of the answers to the queries designated as worthy to be competed for by their predecessors.

2. All answers presented with a view to compete for the prize shall be handed in anonymously, but distinguished by a motto, and accompanied by a sealed envelope, directed to the President, inclosing the author's name and address, and bearing on its face the same motto as the essay.

3. The Committee shall determine, within eight weeks after the annual meeting, which, if any, of these anonymous essays may be worthy of the prize, and they shall apprise the President of their decision, who shall communicate to them the name of the author. The unsuccessful papers shall be returned to the President, who alone shall be authorized to return them to their authors on demand. The successful essay shall then be handed to the Publishing Committee.

4. Should none of the papers, expressly offered as competing for the prize, be found deserving thereof, the committee may select any other paper presented to the Association, either as answer to a query or as a volunteer essay, which they consider of sufficient merit to be entitled to the award.

Respectfully submitted,

CHARLES RICE,
GEORGE C. CLOSE,
EDWARD P. NICHOLS,
Committee.

NEW YORK, April 10th, 1877.

MR RICE.—It is very doubtful whether the plan recommended will work after all. The committee thought it was worth while to make a trial and see if some change could not be made. After making the report we discovered that a somewhat similar plan had been adopted by the Association once before. Under the present system it seems that papers of sufficient value to be entitled to the prize are not generally offered, because the publication is so long deferred that members prefer to publish them in advance of the meetings of the Association rather than to wait until the meetings. We would like to hear the views of some of the other members.

MR. MENNINGER.—I move that the report be accepted.

THE SECRETARY.—There are, however, other suggestions contained in that report, and it would be very unfortunate if it should be passed over without any action thereon. I would move to amend that it be referred to a special committee of three to report on those suggestions.

The motion as amended was carried, after which the Secretary read the report on Legislation, including a paper by Mr. S. S. Garrigues, which were accepted and referred for publication (see page 380).

MR. MENNINGER.—I hope the Permanent Secretary will pardon me for not having reported to him a subject I should have reported. There were two efforts made at legislation in New York during the past year. They were, however, both ineffectual. One was an effort on the part of some druggists

of Brooklyn to bring Brooklyn under the Pharmacy Act of New York. We made a grave error, and our making it impels me to speak of it here in order to caution others not to be too impulsive in the effort to raise and legalize the standard of our profession. I drew a bill which was presented before the legislature of New York, requiring every druggist, both proprietor and assistant, who was not a graduate or licentiate of pharmacy, to appear before a board of pharmacy for examination, such board to be composed of pharmacists and physicians. The result was a very decided opposition to this bill. The opposition came principally from the druggists; and now after the heat of the contest is over, I confess that we made an error in attempting to have a law passed which was retroactive. I doubt even if such a law were passed whether it would stand the test of our courts as to constitutionality. I doubt whether under our constitution we can legislate a man out of business. I think it cannot be done, and the more I have thought upon it the stronger I am in that view. If we had proposed a law which should regulate the practice in the future, and restrict the entering of incompetent persons into the business, I think we should have been successful; but attempting to do too much, we accomplished nothing at all. Another act was introduced into the legislature of New York through the instrumentality of some physicians in New York, in order to introduce metric weights into the practice of pharmacy in the city of New York. This law, if it had been properly drawn, and if it had not only applied to pharmacy or to the city of New York alone, might have been a laudable one; but it was limited merely to the practice of pharmacy in the city of New York. Another grave defect of this act was, that it appointed an inspector of weights who was nominated or appointed by the mayor of New York. There was no provision for the competency of this inspector, and no provision for standards of scales or of weights. The bill was otherwise very defective. The pay of the inspector was dependent upon the fines that he imposed, which would, of course, in the hands of a dishonest or incompetent person, be a means by which he could oppress the entire drug trade of New York. These various defects impelled the College of Pharmacy of the city of New York to oppose the act. A committee of the board of trustees went to Albany, made an argument before the Committee on Public Health, and the act was not reported upon favorably by the committee, and therefore failed to pass. I will say in connection with this subject of legislation, that one result of the agitation of the question in Kings County, New York, was the formation of the Kings County Pharmaceutical Association, which is at this meeting for the first time represented in this body.

The report of the Committee on Maximum Doses and a Sign for Unusual Doses being called for, the chairman, Dr. Pile, stated that the committee had no report to offer, since the committee appointed by the American Medical Association made no answer to the appeals of this committee.

The report of the Committee on Adulterations and Sophistica-

tions was read, accepted, and referred (see page 352). Dr. Pile, a member of the committee, made the following statements:

The paper on adulterations and sophistications, which has been presented, is the result of Mr. Emlen Painter's labors almost exclusively. Mr. E. A. Sargent's report is, however, incorporated. My own endeavors to gain any new information on this very important subject have proved fruitless. In fact, nearly every subject has been previously published in the journals, and it seems to be almost useless to collect these various essays on adulterated articles and publish them anew in our Proceedings the year following. I would here call attention to a very cunningly devised sophistication of sponge, sent from a sponge dealer in New York to a house in Philadelphia. This was a very superior article of bathing sponge, fine texture and color, but decidedly heavier in its specific gravity than a sample previously sent. Upon investigation made by soaking it in hot water and compression, a large amount of mucilage or glue water well incorporated with powdered glass was detected; the sponge was promptly returned to its evil source. The other remark I will here make is on the new article of dialyzed iron. A sample from a first-class house of Philadelphia I found to contain only 2.75 per cent. of well-dried iron oxide, and to have a gravity of 1.022. I would suggest that no dialyzed iron be purchased without taking its specific gravity, and ascertaining the amount of oxide contained in it.

Mr. Ebert.—In connection with this report, I would like to call attention to two specimens of galbanum which I found in the Chicago market, and which seem to be a mixture of resin dissolved in turpentine, with a very small trace of galbanum added. I don't know what the market may be in other cities, but this is a fair representation of what I found in Chicago.

Mr. Bedford.—Strained galbanum is never, and cannot be pure.

Mr. Ebert.—Can it be purified according to the process laid down in the Dispensatory, and perhaps in other works, by heating it to about 212° F., and passing it through a sieve?

Mr. Bedford.—I doubt it.

Mr. Ebert.—Such a process is recommended. Never having manufactured it, I don't know enough about the article.

Mr. Remington.—I would like to ask Dr. Pile in regard to dialyzed iron: What standard he adopted in regard to the strength. I notice he took the specific gravity of the sample, and the amount of peroxide it contained. What is regarded as the standard of strength?

Dr. Pile.—I can't say what standard was adopted by the firm. I have incorporated the subject in a little volunteer paper, which I will read. Five per cent. I believe is the standard.

The Secretary.—Not of oxide, but of the dry residue left when evaporated at the boiling-point of water. Consequently it is the hydrated subchloride or oxychloride of iron.

Mr. Remington.—Whose standard is that?

The Secretary.—That is the standard generally adopted in Europe, and lately adopted by the Paris Pharmaceutical Society.

MR. MENNINGER.—I wish to relate an observation recently made in Brooklyn. Not exactly an adulteration, but certainly a sophistication, and that was glued corks. They were very nice rounded bottle corks, but on close examination I found they were glued together. They had evidently been made by gluing sheets of cork together before the corks were cut by the machinery. It was very nicely done, and at first sight would hardly show. My attention was called to it by another gentleman in the trade, and I simply mention it as a curiosity.

Mr. Remington read a report on the pharmaceutical exhibits at the Centennial Exposition, supplementary to the one published in last year's "Proceedings." It was on motion accepted and referred. (See page 362.)

Mr. Menninger, Chairman of the Business Committee, moved that the Association now adjourn to meet at three o'clock this afternoon, and proceed from the meeting room to the hall where the exhibition is held. The motion was carried, and the Association, guided by the Committee on Specimens appointed at the first session, proceeded to examine the articles placed on exhibition. (See Report, page 377.)

Third Session.—Wednesday Afternoon, September 5th.

President Saunders called the meeting to order at 3 o'clock. After the reading and approval of the minutes of the second session, the Business Committee called up the amendment to the By-laws, which was proposed by Mr. Eberle, at the fifth session of the twenty-fourth meeting, and is as follows:

Add to Chapter VII, Article 10, the following:

A motion to expel a member shall be laid over to the session next succeeding that at which the motion is made.

MR. EBERLE.—I have nothing to say in reference to the proposition. It seems to me it explains itself. Those who were in Philadelphia are aware of the circumstances under which the motion was made. It was made at the suggestion of a number of members, who conceived it proper when the Association had cause for grievance against a member, and a motion for expulsion was made, that it should lie over to the next succeeding meeting before being acted upon. The reasons given at the time were due to the fact that the Association was considered guilty of hasty action in so summarily ejecting one of its members. At that time it was considered that the motion would do no

harm, and was in conformity with the wishes of a large number of those present at the time.

Dr. Squibb.—I think if the Association had been wrong in its action through haste, that action would have been reconsidered and recalled. The motive of the amendment, to prevent hasty action, is a good one; but the question is, whether in preventing hasty action we shall not prevent prompt action, and it often happens that when bodies do not act promptly they do not act at all. If an aggrieved member, as was the case in the instance cited, makes a very great commotion in the Association, wastes a great deal of time, and has his case postponed until another session, often has the opportunity of wasting as much more time, which might be the practical effect of this change. Then the advisability of the change becomes doubtful. I as much as any one, I hope, deprecate hasty action, but I deprecate more a want of prompt action in cases of this kind. They are necessarily extremely disagreeable, and prompt action often saves time and temper.

Mr. Bullock.—While I think the action of the Association at Philadelphia was entirely proper under the circumstances, there may occasions arise in which some improper remarks or conduct on the part of a member would lead members to vote for his expulsion, if the question were taken immediately; but that member may be brought to see the error of his ways, what he was doing, and if time be given him, may be willing to apologize for what he has done. I have no fears, as Dr. Squibb has, that if a member is guilty of improper conduct, the Association would not act promptly at its next session, and I think we can prevent any hasty action by adopting that amendment.

Mr. Calder.—Do we understand this amendment to mean another session of the meeting, or that such motion be laid over until another year?

The Secretary.—Another session of the same meeting.

Mr. Wellcome.—Suppose it was the last session of the meeting?

The President.—In that case it would necessarily lie over until the next year.

Mr. Wellcome.—What I refer to is, if the complaint should be made, or the offence should occur during the last session, the case would have to be laid over for another year before expelling the member.

Mr. Menninger.—It would have to lie over another year.

The question being taken, the Secretary counted the votes, and announced that of those present, 19 had voted in the affirmative, and 7 in the negative. The proposition not receiving the votes of three-fourths of the members present, as required by Chapter X, Art. 2, therefore *failed* to pass.*

* The Secretary had erroneously informed the President that a vote of two-thirds was required for changing the By-laws, the same as provided in Chapter VII, Articles 2 and 10; the Chair, therefore, decided at the time that the amendment to the By-laws was passed, but has since been informed of the error.—Secretary.

The reading of the reports of the Committees on the Drug Market and on the Pharmacopœia was for the present deferred. The President announcing that he would now appoint the committee to consider the suggestions made by the late Committee on Prize Essays; Dr. Squibb said:

Might I suggest before that committee is named, whether it would not be well to leave those suggestions to the new Committee on Prize Essays, which is a very competent committee, and could take these suggestions and bring them up another year with the suggestions of another committee superadded?

THE PRESIDENT.—The suggestion seems to be an admirable one, and I think the members could not do better than to indorse it.

Dr. Squibb's recommendation was adopted.

Mr. Remington read the following report:

At a meeting of the committee to report on the place and time for holding the next annual meeting, it was unanimously decided to propose the city of Atlanta, Ga., as the place, and the third Tuesday in September, 1878, as the time to hold such meeting.

Respectfully submitted,

JOSEPH P. REMINGTON,
T. ROBERTS BAKER,
ALBERT E. EBERT.

MR. KENNEDY.—I move the acceptance of the report and the adoption of the recommendation, and, in support of the motion, I wish to say, that having lived in Memphis, Tenn., for a year, about nine years ago, I know a little about the feeling of the druggists in Memphis and the adjacent territory. Having been in charge of the prescription and retail department of a large house, I often heard the druggists express themselves as hoping that in a not very distant time a meeting of the Association would be held in one of the Southern States. I think it will be the means of stimulating the druggists there, and increasing our membership largely. These are my reasons for moving to adopt the recommendation.

MR. REMINGTON.—The committee have taken some pains to inquire as to the routes by which Atlanta is to be reached from the North, and also in regard to the topography of the adjacent country, and the general healthfulness of Atlanta. From all the information they can get, we believe that Atlanta will be as healthy a place as any we have gone to. The ratio of deaths to the thousand in Atlanta is eleven, which is a very good rate. The country all around there is elevated. There is a choice of many routes to reach that city, and the principal stopping-over places are as healthy as can be expected. The recent pharmaceutical movement in Atlanta renders it very desirable, in the opinion of this committee, that that place should be selected. Atlanta being the pharmaceutical centre of that section, many of the pharmacists

themselves would come to the meeting, and we could, doubtless, do a great deal of good there.

THE PRESIDENT.—There is a gentleman present who has done much to add to the comfort of this gathering, whom I wish to present to you. This is his Worship, the Mayor of Toronto, Angus Morrison, Esq.

The meeting was addressed by Mr. Morrison, Mayor of Toronto, as follows:

MR. PRESIDENT AND GENTLEMEN: I regret exceedingly that in consequence of business which took me away from the city, I was not present to welcome you to my adopted city. It is true I do hold the position of Mayor of Toronto, and I feel proud of the position, but I feel equally proud to see so many distinguished gentlemen assembled in this city. It is a gratification to me to find you here from all parts of the world, and particularly from across the line. In one word, I greet you and welcome you to this room and to this city, and I give you all the rights and privileges of the citizens of Toronto, and if any of you get into trouble, you may rest assured I will look after you.

The remarks were greeted with applause, and after the Mayor had retired the regular business was proceeded with.

MR. EBERLE.—In regard to our next meeting, there appears to be a sentiment among the Southern members, who are presumed to know better than the rest of us, what would be the proper time for meeting in the South; that the month of September would be too early for two reasons. One might be termed the unhealthfulness of the section; or, at least, that it would be that portion of the year when Northern members might be liable to attacks of disease, in certain localities in the South, if not at Atlanta itself; and secondly, that during September, Southern merchants are very much in the habit of coming North to make their purchases, and returning in October. I judge that September was fixed from reasons which were mentioned this morning, and which our Secretary said would not hold good against meeting later—that of the opening of our educational institutions. If that is not to prevail with more than ordinary force, I would move an amendment, at the suggestion of those gentlemen from the South, that the second Tuesday in October be selected instead of the third Tuesday in September.

MR. BEDFORD.—I rise to second that motion, believing it will be for the interest of the Association in every respect, to meet at a later day than the time named in the resolution offered by the committee, on the third Tuesday of September. A great many of us would not care to go so far that way, for the reasons just mentioned, the absence from home of the Southern people; it is, therefore, desirable that we defer the meeting until later in the season. I think it would be difficult to get many to go there in September.

DR. SQUIBB.—In my mind it is less a question of health that concerns us than the question of getting a meeting there. All who hold life insurance policies would need to get permisson to go at that season of the year. If it

be postponed until October, when pharmacists become busy, I think there will be so few that will be able to go from the principal cities, there may be a risk of having few papers and only a local meeting. I am not opposed to meeting in Atlanta, and think the third Tuesday of September is as late as the meeting ought to be held. During September a large proportion of the pharmacists take their vacation, as being the best time to leave home.

Mr. Menninger.—Dr. Squibb has anticipated me to a great extent in the remarks I was about to make, but I wish to add a single word of my humble opinion. That is, in October the busy season has opened, and many of us who can go away in the transition from the summer to the fall season, could not go later. Many of those of us doing business in the larger cities have rather a good opportunity for going at that time, when many of our customers are off and trade too slack. If you wait until October, it is time that business opens; or if it does not open, we are actively engaged in preparing for the fall trade. Besides that, the colleges have commenced then. Mr. Maisch has remarked that one professor can be spared; perhaps that can be arranged, but not without detriment to the college. The lectures are three times a week. Perhaps a professor absenting himself from his course cannot find a suitable substitute, and it is questionable whether it is worth while to take that risk. Taking all the reasons together, I cannot see why we should depart from our custom of meeting in September.

Mr. Wellcome.—So far as the sanitary condition of Atlanta is concerned, it is entirely out of the line where any apprehension of malarial trouble, or other diseases that people fear in going to the South, need be apprehended. As regards the Southern druggists, I must say, that I spent most of last winter in the South, met many of the leading druggists, and discussed the meetings of the Association there in the near future. I found a very strong desire that it should be in that section. Many druggists there feel that they have been almost isolated from the meetings; that this is almost entirely a Northern Association, and that they have had but little share in it. We have members there that have taken an interest in the Association, and desire that the Association have a meeting in that section. In discussing the subject with these members, September was thought as desirable to them as any; if later in the fall, it would come in the commencement of their busy season. I hope the motion to go to Atlanta will prevail, and I think no one need apprehend any danger on the score of health.

Mr. Menninger.—I move an amendment to make it the first Tuesday in September.

Mr. Cassebeer.—I hope that will prevail. As a member from New York city, I know something about the business there. Three-fourths of our members could not go to Atlanta later than the first or second week in September.

Mr. Menninger.—As to the heat of the climate, I have lived in the South twelve or fifteen years, and I can assure the gentlemen that the climate is just as genial and mild there in September as in Philadelphia or New York.

Mr. Ingalls.—You can go to Atlanta in June, July, or August, with as much impunity as you could come to Toronto. There is no difficulty at all.

Mr. Tarrant.—I feel, being a young member of this Association, delicate in attempting to address you at all. I know one meeting of this Association in the South will do more good than to meet ninety-nine times in any Northern or Western city. Within the past year, in the Southern States, we have endeavored to reorganize our former Association. In my own native State, South Carolina, there has been lately a society organized. In the State of Georgia, where I am now located, we have now a flourishing organization. We have a society numbering seventy-five or seventy-eight members. We have all told, throughout Georgia, about one hundred and seventy-five members. Our next meeting will take place in Augusta, in April, and I feel assured, from the number of applications we have on hand at this time, we will roll into that organization fully one hundred and fifty active men. Furthermore, in case of a meeting of this Association in Atlanta, I feel confident that every man connected with that association will unite with us. Alabama is backward; Louisiana is not heard from; Mississippi is in the dark, and down from the shores of Florida we have no account. I do hope you will not hold back in this matter, but come to the South, show us the light of your countenance down there, and I assure you you will meet with a warm reception.

Mr. Shinn.—I think there seems to be no doubt as to the propriety of holding the meeting in the South; the only question is as to the time, and if the Southern members can assure us there is no danger to health, and no inconvenience from warmth by going there the first Tuesday in September, we will have a larger meeting then than at any other time. Perhaps the Southern members can relieve the minds of the members who are anxious on that subject.

Mr. Ingalls.—I regard Atlanta as a very delightful place of resort. I don't think there is any trouble about the heat, and, so far as disease is concerned, I am sure there is no trouble.

Mr. Shinn.—I think any one who could stand the heat of Philadelphia, during the summer of 1876, can stand that of Atlanta.

Mr. Menninger.—I have been in August in Atlanta, and in August in Philadelphia, and from my experience during those two visits, I should prefer that of Atlanta to that of Philadelphia.

Mr. Sheppard.—It has undoubtedly become a noteworthy fact that the meetings of this Association have become, to a large extent, the time when druggists throughout the country take their vacation, and that to a certain extent explains our large meetings. If we have our meeting in Atlanta in October it is too late for a vacation; so if we are going to postpone it at all from September, I should like to make another amendment, that we make a winter vacation, and have it in December. I will not, however, move that as an amendment, because I am rather in hopes that the September meeting will pass.

Mr. Eberle.—I have no desire that the time should be taken up in voting on the amendment I offered. I supposed there was quite a difference of opinion between different members from the South. Those who advocated the suggestion I made have not responded in my defence; and, consequently, I think I shall be perfectly justifiable in withdrawing my amendment, and allowing you to work without that embarrassment.

The Secretary.—I have repeatedly heard from members in the Southern States that they were unable to attend our meetings, because they were held in the first half of September. Here we are not able to judge of that, which was given as one of the reasons, why, heretofore, we have had such a small attendance from the Southern States. To me personally it is immaterial when we go.

Mr. Eberle's amendment having been withdrawn, the question was taken on the amendment offered by Mr. Menninger, which was carried by a vote of 43 against 6, and the motion as amended was then passed.

The Committee on Papers called for the reading of answers to queries, and Mr. W. McIntyre read the following communication in answer to Query 45.

Query 45.—What advantages would result from the substitution of parts by weight for absolute quantities in the revision of the Pharmacopœia, and if any disadvantages other than those incident to change, what are they?

Continued to S. P. Sharples, Boston.

Boston, August 25th, 1877.

After careful examination of this subject, I find no reason for changing my views as given last year, which may be briefly expressed as follows: If the present system of weights and measures are adhered to, it will be best to express the formulas in these weights. If the metric system is used, then they may be expressed indifferently in parts or absolute weights. In case parts are used, they should be accompanied by some brief indication of the amounts of the product, when the parts are taken in grains, pounds, or ounces.

S. P. Sharples.

Dr. Squibb.—I must beg to dissent from the conclusions arrived at by so good an authority as Prof. Sharples. Those of us who have had some experience upon this subject for some years past, and have seen the working of it in foreign pharmacopœias, must, I think, dissent from that conclusion. I think the reason for Prof. Sharples's conclusion is, that he has considered the subject rather as a chemist than as a pharmacist. We ought to remember that pharmacy is not chemistry, and that a method which might be well adapted to the pharmacist would be inappropriate to the uses of the chemist. I feel very sure that any one who will try the processes of the German Pharmacopœia, as at present expressed in parts, will find the method an extremely convenient one for pharmacists. This is not a new subject with me. I urged

it strongly as early as 1860, and have proved it in a greater or less degree ever since that time, and so far have found it convenient and easy. It tends to avoid many errors in the hands of persons not expert, and is the best substitute for the metric system that I know of.

Mr. Markoe.—I agree with Dr. Squibb in his preference for expressing quantities in parts by weight. It has been my practice for some years to follow that plan, and I find my assistants make less mistakes, and grasp the manipulations easier. If we are to adopt the metric system, it is a capital introduction to that. I hope the Association will give the weight of its influence in that direction, for it is certainly a point of very great practical usefulness.

Mr. Gregory.—I will add my testimony to that of Dr. Squibb. I have been in the habit of using the formulas of Wittstein, as given in his practical pharmacy, and have found no difficulty in using parts by weight, both in liquids and solids.

The Secretary.—It has only been a few months since I wrote one or two papers on this very subject. I am certainly very much in favor of the course as advocated by Messrs Squibb, Markoe, and Gregory. There is not the slightest difficulty in following that plan, and as regards the present formulas of the Pharmacopœia, which Prof. Sharples called attention to in his report last year, I believe the difficulties are by far overrated. To follow, for instance, the French Codex, which contains a large number of complicated formulas, there is not the slightest difficulty, and still you will find there only figures expressing parts by weight.

Mr. Sheppard read a paper by Mr. Joseph Roberts, on Cantharidal Collodion, in answer to Query 10 (see page 417).

Mr. Shinn.—Perhaps the committee can tell us the difference in the menstruum proposed and in the officinal.

The President.—In the officinal the material is ordered to be exhausted with ether, subsequently with alcohol, and evaporating the second product until it is reduced to one fluid ounce, which is mixed with the reserved portion measuring 15 fluid ounces.

Dr. Squibb.—I have never had any difficulty in using the proportions in the Pharmacopœia. The difficulty has always been in the cotton. The solubility of the cotton depends less upon the relation of the two menstrua than upon the cotton itself. The cotton is variable, and unless good, difficulties arise, but when the cotton is good I have no difficulty in using the officinal process. There is, however, an objection to the officinal cantharidal collodion which has been one of some years' standing now. That is, it does not use acetic acid or acetic ether. One or the other should always be in the menstruum, for the reason that cantharides have a large proportion of the cantharidin combined with ammonia, and this combination requires breaking up.

The President.—My experience has been different in regard to this preparation. I find it extremely difficult to dissolve the cotton when following

the process as recommended by the Pharmacopœia, and have usually been in the habit of taking a portion of the ethereal fluid, perhaps 8 or 10 ounces, where a quantity of 90 ounces was operated upon, and evaporating that by exposure to the air to dryness, and substituting an equal quantity of alcohol. Then the cotton is dissolved without trouble; otherwise it remains in a gelatinous mass at the bottom. I have generally used Anthony's cotton, which is very soluble.

Dr. Squibb.—There are two or three grades of gun-cotton made by the manufacturers; insoluble, and ordinary cotton, and what they call soluble cotton. The soluble is that which makes the best collodion, and the only one that is proper to make the collodion of the Pharmacopœia. The cotton made by the officinal process is liable to the objection the President has just mentioned. Often it will not dissolve. I have long since given up making the cotton, and always buy it from those who make it for the photographers, try a small portion of each parcel, and if it does not dissolve, return it to the maker.

The President.—I cannot say whether this cotton is labelled soluble cotton or not. I know it dissolves readily in the mixture of alcohol and ether, whereas it does not dissolve unless the alcohol is added.

Mr. Ebert read a paper on Oleate of Mercury and Ointments containing Various Oleates (see page 415). The essay was written by Mr. W. S. Thompson, in answer to Query 15.

Dr. Squibb.—I am at a loss to know why Mr. Thompson uses such a roundabout process for making his oleates. I have never found any difficulty in dissolving the mercuric oxide in the oleic acid without any of the circumlocution which Mr. Thompson uses. The yellow oxide of mercury cannot be made according to the officinal formula. But when properly made it will dissolve in oleic acid when perfectly dry and without heat; and the general failure is in the application of heat. If any heat be used beyond blood temperature the oleate decomposes and a precipitate will be found in the bottom of the bottle. If a bottle of oleate of mercury be set in the sun or near the stove in winter it will decompose. There is no necessity for the reprecipitation of the mercury, neither is there any use of the alcohol in the solution of morphia, atropia, etc. The alkaloids dissolve readily in the oleic acid without the intervention of alcohol. Again, in the use of quinia, it is not at all necessary to precipitate it freshly. The ordinary quinia of the market dissolves very readily in oleic acid. Mr. Thompson says he uses the oleic acid prepared by me, and it is of such oleic acid that I speak. I am opposed to the use of cosmoline because it is a patented article, and it is not proper that a pharmaceutical formula for general use should include patented or proprietary ingredients. We know that cosmoline and vaseline are varieties of paraffin, and paraffin, in all its varieties, is accessible without need of patents and sensational names.

Mr. Remington.—I have had some experience in making oleates, and can bear out Dr. Squibb in regard to making the oleates directly without the in-

tervention of heat. I have had little or no precipitation of mercury when so made, but almost always had it when heat was applied, even when the water-bath was used. One point in regard to cosmoline and vaseline. Some time ago, the theory was announced that the cause of the precipitation was due to a change in the oleic acid, such as rancidity or oxidation, and I suppose that Mr. Thompson has acted on the theory that vaseline and cosmoline being substances which were advertised to be not capable of oxidation and would preserve the oleate of mercury. Right here I wish to make a point which some of my brethren may have already noticed, that cosmoline and vaseline do change; they both do get rancid. I have found specimens which had been put away for six or eight months so rancid as to be unfit for use. On one occasion I made some pomade, some of which was returned. It was simply and purely vaseline with a very little perfume. Then I took the trouble to set some away and found that it acquired the same disagreeable odor—the odor of rancid fat, although it was somewhat smoky. Then I looked through the specimens which had been presented by the manufacturers to the cabinet of the Philadelphia College of Pharmacy, and supposed to be creditable specimens—they had been there about a year—and I noticed the same change had taken place in them; so, notwithstanding the fact of its being a patented article, I don't think we can rely upon it to prevent rancidity.

Mr. Markoe.—My experience coincides with that of Mr. Remington. Only the week before I left Boston I had occasion to look at a parcel of cosmoline that had been in the laboratory, opened loosely, for something like two years, and it had become very disagreeable. It seems to me if vaseline and cosmoline are of any use, since we know them to be nothing but paraffin and paraffin oils, it is easy to make them artificially, as wanted. I think that point has already been well worked out by Dr. Miller and some others. In Boston, the Donner Manufacturing Company make, for pharmaceutical use, an article they call artificial almond oil. It is a heavy paraffin oil, carefully made and pretty thoroughly deodorized, and, it seems to me, mixtures of that oil with a proper amount of the softer grades of paraffin might be used in making a mixture of any consistence that may be required for pharmaceutical use, if it is advisable to use these things as diluents.

The Secretary.—Messrs. Remington and Markoe state that these paraffins get rancid. Is that strictly true? I don't see how they can get rancid unless containing fat.

Mr. Markoe.—The manufacturers claim it to be paraffin. I don't know that it is. I know the article they do put up does take on a disagreeable odor, whether it is due to rancidity or oxidation.

The Secretary.—Is it not, perhaps, the odor of petroleum redeveloped?

Mr. Remington.—I think I qualified the word rancid. If I didn't, I intended to. Exactly what rancidity is due to I believe is an open question. It is difficult to give it an exact term, but for all practical purposes it was rancid. It was disagreeable in odor, and a change had taken place, evidently an oxidation, and it was unfit for use. That is the point I wished to make.

Mr. Kennedy.—I have had a five-pound can of cosmoline in my store for a year and a half, and I have not noticed any change during that time. The article had been well secured and covered when not in use. In regard to making oleates, I never had occasion to make but one, the oleate of quinine. I found no trouble in making it, using Dr. Squibb's oleic acid, by simply rubbing the article up in a mortar, and the quinia dissolved almost instantaneously.

Dr. Squibb.—One more suggestion in regard to oleates. In my experience, the 20 per cent. oleate of mercury is the most permanent of all. As you all know, it is a soft solid and it stands warmth better than the liquid preparation. I think the practice, if encouraged, would settle down to the use of one strength, and have it diluted at the time of using if necessary, but I doubt if it be necessary, because surgeons are becoming much more accurate than formerly, and the quantity of 20 per cent. oleate could be so adjusted as to get any desired mercurial effect; that is, one-fourth part of the 20 per cent. oleate would answer the purpose as well as the entire part of the 5 per cent., and would be more easily applied.

Mr. Gardiner.—I would like to inquire if any gentleman has made any oleate of iron which was not objectionable on the score of odor. I made it once, but it was very offensive. It may have been due to the quality of oleic acid I used.

Mr. C. Robbins read an essay on Veratrum Viride (see page 439), in answer to Query 2. A small sample of his veratridia had been placed in the exhibition room.

Mr. Bullock.—Since the publication of my paper in the "American Journal of Pharmacy" of last year, I have gone over the ground again, using the Veratrum viride which I obtained from North Carolina, and carefully inspecting it to see that it contained nothing else. In the preparation of the alkaloid, to avoid any modification produced by the use of caustic alkalies, the alcoholic extract, after being freed from alcohol by long exposure in the drying-room, was treated with petroleum benzin to remove the oil. The extract was then treated with warm water acidified with acetic acid until all soluble matter was removed. The alkaloid was then precipitated by an alkali, purified and treated with pure ether, to which it yielded between 2 and 3 per cent. of its weight. The portion soluble in ether was dissolved in acetic acid, precipitated by nitrate of potassium, and the mother water precipitated by soda, the precipitate redissolved and again precipitated by nitrate of potassium, and this process continued until about one-tenth of a grain only of product was left. This, on examination, was shown to be jervia mixed with some resin. I would inquire whether Mr. Robbins was sure of the quantity of his Veratrum viride, and that it contained nothing else, for I never met with any such reaction causing a blue color with sulphuric acid in all my investigations with Veratrum viride products. I endeavored to obtain veratria in various ways by precipitation so as to show the form of the crystal. In this endeavor I observed that a solution of veratria, made alkaline with bi-

carbonate of soda until it distinctly restored the color of reddened litmus-paper, remained perfectly clear and undisturbed for two weeks during the hot summer months. I consider the color test to be of very little value; that the only true recognition would be the form of the crystal. The form of the crystals of jervia under the microscope have been figured in the journals. They are well marked in character. As a matter of interest, I will add that in dialyzing the products of Veratrum viride, in the endeavor to separate the alkaloid from resin, the latter dialyzes with the alkaloid, and a solution of the alkaloid left the resin in a divided condition, which could be separated by filtration, and proved on examination to be resin.

Mr. Robbins.—I used every possible care to get Veratrum viride which I deemed to be pure; the drug used was examined pharmacognostically with great care, and I feel certain that the rhizome employed was that of Veratrum viride unmixed with any other. I would also say that the color test has to be made very carefully. It only occurs after three to four hours' standing. I remember Dr. Squibb being in our office one day, and I showed him on the rim where the blue coloration was beginning to take place. I have a portion of the sediment in my pocket, and should be glad to make the reaction if gentlemen would like to see it. The presence of jervia will spoil the blue reaction, and I have never been able to get the blue coloration with it. I hold when I have got Veratrum viride absolutely unmixed with anything else, I have used all possible care. I obtained the root as it is in commerce, and made my selection from that, but have not gathered it in the place where it grows.

Dr. Squibb.—I would ask whether Mr. Robbins depends entirely upon the color test for his alkaloid?

Mr. Robbins.—No, sir, decidedly not; but I merely give it as one good test, which, I think, can be relied upon as a help to distinguish the alkaloids. In the first place, the solubilities are different, and it does not give the reactions that jervia gives. It does not give the red reaction that veratria does, and this is one of the reactions which I hold to be characteristic of those alkaloids.

Dr. Squibb.—I have no great faith in the color test. That is to say, these organic compounds, whether they be really alkaloids or whether they be something else, are very easily "cracked;" they split up under chemical reactions very easily. The idea I want to express is illustrated well in the case of opium. We have some twenty-seven products from opium. These twenty-seven bodies that are alleged to come from opium are not, probably, all of them in the opium, but their elements are present in such a condition that a very large proportion of them are the results of the chemistry that is applied to the opium. These researches have to be gone over and over again before anything very definite can be based upon them, and even then the question comes up as to whether the substances found are not the results of the chemical reaction rather than pre-existent in the organic substances from which they are obtained. I think Mr. Robbins is exactly on the right track, and if he will continue on and re-examine his work as Mr. Bullock has done, and

go over it again and again, his results will be very important and well worth his labor.

Mr. Robbins.—I have gone over this subject in many different ways and always obtained the same result, getting this crystalline principle at the end. It would, of course, be of value to have an ultimate analysis of the veratridia. This, however, would involve no small amount of labor, as not less than 300 to 400 pounds of the rhizome would have to be used, and after obtaining the alkaloid in sufficient quantity and purity for purposes of analysis, on account of its analogy with veratria, the ultimate analysis would probably be a difficult one.* This involves an amount of work which I shall be very happy to undertake if I have leisure, but which I cannot promise to make. I hope any gentleman who has leisure will undertake it.

Query 22, referring to a supposed False Senega Root, was called up.

Mr. Maisch.—I have no written reply to make, for the reason that I have been unable to obtain even a sample of the root. Several of my friends in New York have been kind enough to endeavor to procure some for me, but have been unsuccessful. I finally was referred to St. Louis, and have learned through Mr. Crawford that it is not generally known in St. Louis, but has been occasionally received by a house there and always sent East. To that St. Louis house it was sent as *white senega* by a general storekeeper at Springfield, Green County, Mo., in the southwestern part of the State. They were likewise unable to find a sample, but promised to furnish some from the first lot they may receive. The "white senega" was sold at twenty-five cents a pound, while true senega was worth sixty-five cents. For the present I would suggest that the query be dropped.

Mr. Sheppard read a paper by Mr. C. J. Biddle, entitled, The Root of Epilobium Angustifolium (see p. 434), in answer to Query 57; and Mr. Ebert a paper on Chloral Hydrate and Camphor (see p. 457), as an answer to Query 51.

Dr. Squibb.—Two or three points the writer seems to have missed. First, whether there is any change in volume. There is not by his statement in regard to the specific gravity, but he don't tell us how accurately he examined these specific gravities. The shortest way would have been to ascertain whether the admixture of the two substances produced any change in temperature or volume. Perhaps some one present knows whether there is any change of the volume or temperature. I don't think his conclusions are quite safe, because under the influence of heat the chloral goes off while the camphor remains behind. I don't think the evidence of its being a simple solution is sufficient.

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* See Dragendorff's Gerichtliche Ermittelung von Giften, page 211, and Archiv der Pharmacie, Band vi, 1877 (E. Schmidt).—C. A. R.

Mr. Nichols, on behalf of the Committee on the President's Address and Secretary's Report, read the following report, which, on motion of Mr. Remington, was accepted:

The committee to whom was referred the address of the President would respectfully report that they fully indorse his suggestion relating to the fund in aid of original investigation, presented through Dr. Miller, the Joint Secretary of the Committee of the American Pharmaceutical Association and the Philadelphia College of Pharmacy, and would recommend the appointment of a special committee, consisting of the Chairman of the Executive Committee, the Treasurer, and Permanent Secretary, who shall be empowered to raise $500 or more by giving each member of the Association the privilege of contributing one or more dollars to the fund. This committee shall securely invest all money received for this object, and all applications for assistance from this fund shall be made to them. Your committee also recommend the adoption of the name "Centennial Fund" as suggested in Dr. Miller's report.

Your committee fully appreciate the importance of the question of life membership referred to in the report of the Permanent Secretary, and it was after much consideration that they decided to recommend a course for the future action of the Association. Under the old constitution the payment of $20 only was required for life membership. At that time the cost of the Proceedings, as well as the running expenses of the Association, was comparatively small. The most sanguine friend of our body could scarcely have anticipated the change that has taken place in our numbers and in the volume that annually chronicles our Proceedings. And while those who bore the heat and burden in the early days, when the Association was struggling for existence, are entitled to respectful consideration, is it reasonable for them to expect that we, who come after, should furnish them with this valuable record free of cost? Although we are often gratified to hear from our worthy Treasurer of the respectable balance on his books, the fact stares us in the face that to meet the expenses of the closing year it is necessary to make a draft on the receipts of the next. Our laws make an invidious distinction between members under the present and life members under the old constitution. While the former are deprived of the Proceedings each year that they fail in the payment of annual dues, the latter receive them for nothing. The latter have paid $20 into our treasury, the former may have paid $50. Your committee would therefore respectfully recommend that in future our Proceedings be furnished life members under the old constitution on payment of $3 annually.

In connection with this subject, and as a relief to our treasury, your committee beg leave to recommend a change in our laws.

Without the fees received from new members through the Executive Committee, our Society would be insolvent. By a provision in our laws delegates become members without the payment of any fee, and the annual dues received from such members are required to pay for the copy of Proceedings furnished them, leaving nothing for the necessary expenses of the Association. We do not understand why this distinction should be made between delegates and elected members, and would respectfully recommend a change in Chapter 7,

Article 6, of the By-laws, by striking out the words "without paying" and substituting the word "and;" also Chapter 7, Article 3, by striking out all after the words "closing year."

All of which is respectfully submitted.

E. P. Nichols,
John Ingalls,
F. J. Casper.

Dr. Squibb.—There is one difficulty which Dr. Nichols will explain. A delegate very often comes here year after year. A permanent member comes as a delegate. A body may send the same delegate repeatedly, or may send pharmacists as delegates who are already members. How would it operate? It will not increase the funds, then, to any extent. A delegate coming here the second year, or some pharmacist coming the second year as a delegate, if he is a member, should not be expected to pay an initiation fee. If he has come once as a delegate, and then comes again, it would not be an initiation fee. Another point is that in regard to life members. This subject of the life members has been up several times in the past few years, and it was distinctly decided that an *ex post facto* arrangement, as applied to those members, was unjust. Now this question comes up again, and as the recommendation is that one of the old life members, who did not choose to resign his life membership, now be taxed $3 a year for the Proceedings or else not receive the Proceedings, it seems to be traversing the previous decision of the Association, which decided that any reference to those old life members which shall tax them in any way is manifestly unjust. They paid their $20 with the expectation, and under the constitutional provision, that it should constitute them life members, and they should receive the publications and whatever accrued from this Association during their lifetime. These life members were addressed personally, each one, and he was asked to relinquish his life membership and come in on the regular roll of the Association. A large number of the life members did so resign their life membership, but there were a few who refused to do so. Now they have the right to refuse and to insist upon the conditions of their original membership. And that right has been fully acknowledged by the Association, and it is unwise and unjust to go back of that decision. These gentlemen are entitled to all the Proceedings of this Association as long as they live, and we must find some other way of raising our money than applying an unjust rule to them. One or two of them, although they refused to resign their life membership, have paid their regular yearly instalment; certainly one of them has done so ever since.

Mr. Shinn.—I believe I understood the Secretary to state there were only about twenty who had refused to give up their life membership.

The Secretary.—There are now on the roll over eighty life members under the old constitution.

Mr. Shinn.—I was under the impression it was a smaller number, and the amount involved was not very great. If there are eighty or ninety still getting the Proceedings gratuitously it does make a difference.

Mr. Sheppard.—How many of the eighty pay the annual assessment?

The Secretary.—None. There are, however, a number who have refused to surrender their right to life membership, but still continue to pay.

Mr. Diehl.—I move that the suggestions be taken up in the order in which they occur in the report.

Mr. Diehl's motion was agreed to.

The Secretary.—There is only one suggestion that can be now acted upon by the Association, and that is the one in regard to the Centennial Fund. The others involve alterations in the By-laws, and necessarily lie over until some other session.

Mr. Diehl.—I move the adoption of that portion of the report relating to the Centennial Fund.

Mr. Remington.—It seems to me that is putting a great deal of work on some of the hardest working members of the Association. I think it would be better to have a special committee appointed for that purpose, who would probably have more time, and can do the work more effectually (without encroaching upon their other duties) than the gentlemen named.

Mr. Nichols.—The committee would hardly have made the nomination if one of the hard-working members had not made the proposition himself. He said probably the work would come on him eventually, and he would willingly undertake it, and as these three gentlemen were as permanent as any we could name, we concluded we could not select a better committee. I think the work will be willingly and well done by the committee.

Mr. Shinn.—The Treasurer, to whom this will be probably referred, will have to send out his regular bills, and with these bills can be sent a printed slip conveying this proposition. I think, however, it will assist him very materially if all the members present should walk up and hand out a dollar or more and save him the trouble of sending out those slips.

Mr. Menninger.—I think a good time to shape the iron is while it is hot, and if the Treasurer will start a list now, and deputize some members enthusiastic in this cause to bore every man to pay up his dollar, it will be the quickest way to get the money in.

The Treasurer.—I am ready from this instant.

The motion of Mr. Diehl to adopt that portion of the committee's report which relates to the Centennial Fund was carried unanimously.

The Business Committee desired to call up that portion of the report referring to taxing the life members for their copies of the Proceedings, but the Secretary considered it to involve an alteration of the By-laws, Chapter VI, Article IV, which directs the Ex-

ecutive Committee to furnish each member not in arrears with a copy, and the chair sustained that opinion, and decided that the proposition would have to lie over to a subsequent session.

Mr. Kennedy read an answer to Query 16, on the Quality and Quantity of Extract of Aloes, prepared with Boiling and with Cold Water (see p. 402), and replied, to a question by the Secretary, that Socotrine aloes had been used in the experiments.

Query 40, relating to Aloin (see p. 401), was answered by Mr. A. P. Brown in a paper read by Mr. Sheppard, after which the Association adjourned to Thursday morning at nine o'clock.

Fourth Session.—Thursday Morning, September 6th.

President Saunders called the meeting to order at 9.15 A.M. The minutes of the third session were read and approved.

The Committee on the President's Address, for carrying out the suggestions contained in their report (see page 526), proposed to alter Chapter VI, Article IV, of the By-laws, by adding thereto the words, "excepting life members under the old Constitution, who shall be furnished with a copy of the Proceedings upon the payment of $3 annually." The proposition lies over under the rules.

MR. MENNINGER.—It occurs to me that that proposition to amend ought to be referred to a committee to ascertain, if possible, whether we can legally pass this amendment and make it operative. Under our first Constitution, these life members obtained rights and privileges which are vested rights, and I am of the opinion, with the limited knowledge of law I have, that they are legally entitled, under the first contract of membership, to our Proceedings, however burdensome it may be to us. We must bear the burden. We can appeal to those gentlemen. Perhaps on another appeal some of them may consider they are really a burden to us now, but in the present condition of their relation to us I doubt whether we can legally place a restriction upon them that was not imposed in the original contract of membership.

MR. BULLOCK.—To have this question examined rightly we ought to go back to the old Constitution and examine what has been said on this subject. That cannot be done now, and I think the proposition ought to be submitted to a committee.

MR. MENNINGER.—I mean all these proposed alterations.

THE SECRETARY.—The Secretary's report, which has called forth the proposition of this amendment, contained no such suggestion. The Executive

Committee, after consulting with the Treasurer and Secretary, came to the conclusion that those members had rights, that the Association had once, in the year 1868, decided in favor of those rights, and that at the present time it could not go back on the former decision.

MR. SHINN.—The subject ought to be called again to the attention of those life members who have not signified their willingness to give up their rights. One was present yesterday who said it was the first time he ever heard of such a proposition, and it is possible that a circular, addressed to the rest of them, may bring forth some response.

The motion of the Business Committee that this proposed amendment be referred to a committee of three was carried.

The Secretary read a paper on Magnesia, by Mr. Leis (see page 451), which was written in answer to Query 17. Dr. Squibb suggested that the author be requested to add to his paper the normal quantity of magnesia which should, by calculation, be contained in the officinal magnesium carbonate.*

Vice-President McIntyre took the chair, and Mr. Saunders, Chairman of the Committee on the Drug Market, read the report of that Committee (see page 335).

MR. SHINN.—In rising to move the acceptance of this report, I think I but echo the sentiment of every member that the Association is to be congratulated upon the information upon Canadian drugs as conveyed in the report of the chairman. It has been a very interesting report indeed. I move its acceptance and reference to the Publication Committee.

MR. MENNINGER.—I am fully of the opinion of Mr. Shinn as regards the value of this paper, but as an ex-member of that much abused fraternity, the Yankee drummer, I would like to call attention to one little item in the report which, I think, is based on a mistake; that is, the victimization of our Canadian friends with sassafras oil. I think if gentlemen will consider for a moment the gravity of the two fluids they will see there must be some mistake.

MR. SHINN.—It struck me at the time that sassafras oil was so much heavier than the water, the water would come out of the can first.

THE PRESIDENT.—I gave the statement on the strength of the information I received from a friend. He presumed it was water, and possibly was mistaken. I saw a quantity of it, and there was an under stratum of clear liquor

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* Mr. Leis, in answer to the Secretary's letter, stated that the formula $(MgCO_3)_3$ Mg2HO.4H_2O, which appeared to be most generally recognized, required 41.39 per cent. MgO; but that other formulas are given, by some authors, varying to the extent of 1 and 2 per cent. MgO. The British Pharmacopœia requires magnesium carbonate to leave, after calcination, a residue of 44 per cent.—EDITOR.

that had the appearance of water, but the difference in the specific gravity never occurred to me then or since, or I should have looked into it.

MR. DIEHL.—It was possible that the oil was not pure, probably adulterated with turpentine or something else that would make it lighter than water.

THE SECRETARY.—Or that the liquid was a solution of salt in water.

MR. MENNINGER.—I hope gentlemen will not tell us all they know about the adulteration of essential oils.

The report was referred, and the Business Committee called up the resolutions concerning the revision of the Pharmacopœia, which were offered last year by Dr. Squibb, for action at this meeting.

DR. SQUIBB.—So far as I am concerned in the unfinished business that is handed down from last year and now called up by the Business Committee, there is nothing to be done. The design and plan with which that was presented to the Association last year has been entirely, and I was going to say ignominiously, defeated. Perhaps that would be the proper word; and so far as this Association is concerned, and so far as that item of unfinished business is concerned, there is no unfinished business now. The American Medical Association has distinctly refused to have anything to do with the subject, and now we are in the condition we were in before the broaching of the subject. The subject was entirely mine; brought up entirely by me, originally in the American Medical Association, and so far as I am concerned it has been entirely defeated and entirely frustrated. It was brought up here with the supposition that the American Medical Association would not take the action which it has done. Now, how far the object which we all have in view—both the American Medical Association and this Association—how far the object of obtaining a better Pharmacopœia is concerned, must be a matter of individual opinion. A large number of the physicians and pharmacists of the United States think we have a good enough Pharmacopœia. It is certainly good enough for me, but it is certainly not good enough for my appreciation of the want of a Pharmacopœia to the American Medical Association and the American Pharmaceutical Association. The whole subject of the Pharmacopœia seemed to me to require reconstruction and reform, and I undertook that subject with hesitation, but yet earnestly and carefully, and with the least possible personality, and proposed a method of reform and a plan for discussion. This soon brought upon me and my propositions an amount of abuse of a character so personal and so intemperate as to be extremely disagreeable, and, therefore, I am now ready to leave the matter entirely and turn my attention to something better than setting up for a reformer, even though still convinced of the necessity of the reform. If this subject be unfinished business from last year, it is, so far as I am concerned, now finished by being defeated, and it may now be dropped.

MR. SHEPPARD.—I wish to say a few words. From my earliest acquaintance with the drug business, I was taught to regard Dr. Squibb as one of the

high exponents of pharmacy, in the highest sense of the word, and I think I express the feeling of all those who have had any acquaintance with him, that the more we become acquainted with him the more we feel that he always has taken his stand on what he believed to be right, and although I am now going to offer a resolution which I don't think he will approve, I feel that the members of this Association will approve of it; at least I hope they will. It seems to me that the position Dr. Squibb has taken during the past two years, his earnest efforts for the improvement of the Pharmacopœia, laying aside any question as to the advisability of his particular plan, and the treatment which he has received, demand of this Association some official recognition of his work, and I therefore offer this resolution:

Resolved, That while there may be, among the members of the American Pharmaceutical Association, an honest difference of opinion as to the advisability of the plan suggested by Dr. Squibb, the thanks of this Association be and hereby are tendered to Dr. E. R. Squibb, of Brooklyn, N. Y., for his earnest efforts, during the past two or three years, to inaugurate an improvement in the plan of the revision of the United States Pharmacopœia.

Mr Menninger.—In rising to second the resolution of Mr. Sheppard, I will state I was about to offer a somewhat similar one. I second it with pleasure, for the reason that an opportunity is offered us here to modify Dr. Squibb's words, which will go upon our minutes; that is, that ignominy had been heaped upon him in this discussion. I think that every one in this room, every member of this Association, will agree with me in saying that slander has been hurled upon him, but no ignominy has been heaped upon him, his name, or his work.

The resolution offered by Mr. Sheppard was passed unanimously.

Dr. Squibb.—I thank the Association for the resolution. I am somewhat sensitive in this matter, and accept the action of the Association with some emotion, although not very emotional, perhaps.

Mr. Hoffmann.—Mr. President and Gentlemen: In regard to the Pharmacopœia question which now engages the interests and desires of the pharmaceutical profession so much and so widely, I beg to offer a few brief remarks.

Having received my professional education in a country where the national Pharmacopœia bears the stamp of governmental authority and the force of law to both the physician and the pharmacist, I have all the years observed, with special interest, how strictly and faithfully pharmacists in general, throughout the United States, recognize and are guided in practice by our Pharmacopœia, which has no other than a self-constituted authority; while, on the other hand, practitioners of medicine, to a great extent, do neither evince much or any interest in the Pharmacopœia, nor do they use the same or care for its revisions and maintenance.

In fact, the evidence is continually accumulating that the Materia Medica of the Pharmacopœia is extensively and irrespectively ignored by a very large number of physicians, in preference to semi-proprietary preparations and ready-made specialties, so much so that it may not be saying too much that the

descriptive price-list of the manufacturers of coated and compressed pills, of granular salts, of fancy elixirs, and other ephemeral novelties of commercial speculation and of problematic value, constitute, to a large extent, what may be called the Pharmacopœia of many physicians of our day and land. Others aver that they do not need a Pharmacopœia, since they carry along, in the various editions of the physicians' pocketbooks, the comparatively small number of standard formulas of the common galenical preparations, their strength and dose, and that, beyond that and the Dispensatory or other works of reference, the practitioner of medicine can dispense with the present Pharmacopœia.

Moreover, every one of you, by his own experience, will be aware of the fact that a large number of eminent and accomplished professors, writers, and practitioners of medicine throughout the land, for various reasons, share the opinion that the preparation and management of the Pharmacopœia and its revisions are now better and more properly left to the profession of pharmacy. This view has strongly, although indirectly, been indorsed by the action of the American Medical Association at its recent meeting in Chicago, by explicitly refusing any consideration of pharmacopœial revision under the plea that "this subject is thoroughly inappropriate to the Association."

Does it not, under such circumstances, and in view of the striking lack of interest of the American Medical Association, and evidently of the medical profession in general, in pharmacopœial revision, seem doubtful if the profession of medicine, at the decennial meeting of the Pharmacopœial Convention in 1880, will be represented at all? And if so, the question may arise whether a sporadic representation by a comparatively small number of medical schools and local societies, as has been the case in the past, can be regarded as commensurate with the importance of the subject, the status of American medicine, and the extent of the country.

In this respect the profession of pharmacy, although still in a minority representation when the total number of the pharmacists of the country and of the local societies is taken into account, is far more adequately represented in the American Pharmaceutical Association. In regard to the Pharmacopœia and its revisions, it certainly takes a much higher and more interested standpoint than the American Medical Association has done. Now, since the profession of medicine, through its national representative body, has distinctly declined any share in the work of pharmacopœial revision, will not this finally fall to the lot of pharmacy? And furthermore, when it comes to real work, will not all so-called representation henceforth, as in the past, have to yield to talent and skill and leave the labor to a few competent and experienced experts, irrespectively of their special occupations?

The necessity of an earlier revision of the present Pharmacopœia has repeatedly been urged, inside and outside of this Association. An elaborate and mature proposition for a new departure for such revision by our distinguished fellow-member, Dr. Squibb, stands on record before the professions and the land, and has met, on the whole, with due consideration both here and abroad. Can American pharmacy afford to drag along much longer with its present Pharmacopœia, not fully commensurate with the advanced state of

Materia Medica and the practice of pharmacy? Can the American Pharmaceutical Association, with its growing strength and influence, afford any more to be ignored by the National Pharmacopœial Convention, and to remain inactive while the vital question of pharmacopœial revision stands before the profession? Will this Association, representing as it does all the incorporated colleges and schools of pharmacy, and all the pharmaceutical State and local associations of the country, continue to play, in the preparation and maintenance of the standard guide of the practice of pharmacy, that subordinate or rather negative part to which it in the past, and to which its present unofficial committee on pharmacopœial revision have been doomed? Or has not, in the growth and history of this Association, and in the drift and advance of American pharmacy, the time arrived when this Association, as the foremost exponent of American pharmacy, and as the proper and competent custodian of the interests and status of both the profession and the Pharmacopœia, is entitled and in duty bound to vindicate its prerogative by henceforth assuming among its objects and aims a more active participation in both the labor and the management of the revisions and publication of the Pharmacopœia?

Therefore, in order to bring this matter properly before the Association, I beg in conclusion to offer the following preamble and resolution:

Whereas, The plan and method adapted for the elaboration of the first edition of the United States Pharmacopœia, and subsequently continued for its decennial revision, in consequence of the improved means of intercourse, and, moreover, by the altered conditions, resources, and requirements of the arts, sciences, and the practice of medicine and pharmacy, require a reform, and

Whereas, The Pharmacopœial Convention, as yet the only authorized body for revising and publishing the Pharmacopœia, is so constituted that it meets for this purpose only once in ten years, and has not acted in time, notwithstanding the recognized necessity of an earlier revision, to make the Pharmacopœia conform with the progress and present status of Materia Medica and the practice of pharmacy, and

Whereas, The American Medical Association, after a full and elaborate presentation of this subject, and of a mature plan for action, at its recent meeting in Detroit has signally failed to evince due interest in or any willingness for co-operation in the important subject of pharmacopœial revision, by indefinitely postponing the proposed project; therefore

Resolved, That the President of this Association appoint a committee of five to take into consideration the advisability and feasibility on the part of the American Pharmaceutical Association, as the national representative organization of the profession of pharmacy, to prepare a complete Pharmacopœia, which may be submitted to the criticisms of the medical and pharmaceutical professions, and may be proposed to the final Committee of Revision, and that that committee be instructed to report early at the next session, so as to leave time for definite action at this meeting.

Mr. Ebert.—In rising to second the resolutions offered by Dr. Hoffmann, I do so for the purpose of bringing the matter before the Association. My own personal views in regard to the matter are, that any change in the re-

vision, whatever it may be, certainly can only be for the advancement of pharmacy, and I hope that this Association will take the necessary steps (as the medical profession have, so to say, ignored this work) to do it, and we will do it well.

Mr. Sheppard —In voting in the affirmative for this resolution, as I propose to do, I do so on this ground. This proposition, as offered by Dr. Hoffmann, is one which, to a large majority of us, is new, and to which we should give thought. As I understand the resolutions, they direct the appointment of a committee of five to report to this meeting, at its next session, in regard to the advisability of the American Pharmaceutical Association making a Pharmacopœia, and as this is so important a question, it seems to me that we should have time to think of it; that we should not at once enter upon the discussion of so important a character. I therefore hope that the resolution to appoint this committee to report upon the advisability of this plan will pass.

Mr. Bullock.—While the resolution is a good one, and the appointment of a committee of five to take into consideration the whole subject is desirable, I think we have nothing whatever to do with commenting upon the action of the American Medical Association. I therefore move to strike out all reference to that Association.

The motion to amend was seconded by Messrs. Markoe and Eberle. President Saunders again occupied the chair.

Mr. Menninger.—There is no reference to the American Medical Association in the resolution.

Mr. Bullock.—In the preamble.

Mr. Menninger.—We have nothing to do with the preamble, if I understand parliamentary law. We adopt the resolution, but the preamble is the view of the mover.

Mr. Calder.—I think with Mr. Bullock, that the preamble goes with the resolution, giving it as the sentiment of this Association and the reason for passing the resolution. I hope if there be any reflection upon the action of the American Medical Association in the preamble that it will be amended.

Mr. Menninger.—I hope both the preamble and resolution will prevail, for the reason that the reflection, if any, upon the American Medical Association is a just and honest one. This Association, as has been said, is perhaps the most thoroughly representative body (with the American Medical Association) that assembles in this country. This Association has now no voice in the revision of the Pharmacopœia. A member of this Association and of the American Medical Association proposes to the latter a plan by which these representative bodies could control the work, which is their guide and their law. The American Medical Association has most signally failed in not adopting this plan, for that was their prerogative, but they have failed to give it any due attention or consideration, or to take the proper interest in the question which we have a right to expect from it, as being interested with us in

this labor. The reflection, if any it is, is a slight but a just one, and I hope the preamble and resolution will prevail.

Mr. Kennedy.—I agree with Mr. Bullock in this respect. I think if we adopt the one we adopt the other. The preamble is nothing more than a statement of the reasons for passing the resolutions, and we cannot take one in and leave the other out.

Mr. Menninger.—I will waive that part of my objection.

Mr. Kennedy.—I have nothing more to say than that I hope the resolution will pass with Mr. Bullock's amendment, and that a good committee will be appointed, and their work submitted to the Pharmacopœia Committee.

Mr. Remington.—I think the action which this Association has already taken in the matter, which is so gratifying to all of us, is sufficient, without naming the American Medical Association. Now we are about to pass a resolution which calls for a committee, and I have no doubt such a committee will be appointed as will thoroughly go over the matter, and it seems to me that it will be much better to take hold of the matter thoroughly and quietly, and give it calm and careful attention. If we mention the American Medical Association, it would appear as if we were setting ourselves up in opposition and wished to pointedly rebuke them, but the act itself, it seems to me, will be sufficient for the purpose and be more effective.

Mr. Sheppard.—Very much depends upon the wording of Mr. Bullock's amendment. I think no member of this Association desires to reflect on the American Medical Association, yet many of us would be very sorry and very unwilling to strike out the whole of that preamble. If an amendment could be worded in some way so that we should not reflect upon the American Medical Association at the same time that we took notice of their action, it might perhaps do some good.

Mr. Menninger.—I fail to see how we can take action on these resolutions without referring to the action of the American Medical Association, for our action is based on their non-action, on their failure to act on invitation. We are forced in justice to our action, if action we take, to allude to the fact that the American Medical Association has failed to take the proper interest, and continues to fail to take interest, in this subject. This Association must rise and assert the dignity of its position. We are a representative body, coming from the isthmus to the northern boundaries of British America. We are the largest and the most thoroughly representative pharmaceutical body in this country, and are we to continue, as we have done, to play as it were a secondary part to an organization of very questionable representative character? Is the American Pharmaceutical Association to stand at the door of the Pharmacopœia Council and simply hand in under the door our new suggestions for the work which is going to govern us, and then be treated as we have been treated, have them take our suggestions and throw them into the waste-basket? This whole subject has been presented to the American Medical Association, and we must allude to their non-action in taking action ourselves.

MR. BULLOCK.—The part of the preamble to which I had reference is this: "Whereas, The American Medical Association, after a full presentation of the subject and of a matured plan for action, at its recent meeting in Chicago, has signally failed to evince due interest in or willingness for co-operation in the important subject of Pharmacopœia revision by indefinitely tabling the proposed project." Now by this preamble will we not be setting ourselves up as censors of the American Medical Association? They are as good judges of their own work as we are of ours. Then I contend there is an untrue statement in it. They have not fallen in with Dr. Squibb's views, but they have evinced no unwillingness to co-operate in the revision of the Pharmacopœia. If you set yourselves up in this Association as censors of another large and influential body in the United States, you will have trouble.

MR. BEDFORD.—I suggest that perhaps Dr. Hoffmann would amend that sentence, which would avoid all difficulty. It is hardly our prerogative to use just the language or pass a resolution of that kind, but the whole can be settled by striking out or modifying a few words of the preamble by the mover himself.

MR. CALDER.—I am not sufficiently familiar with the action of the American Medical Association to say that they had not taken interest in it. There is already a Pharmacopœia Convention, in which they are the principal actors. Why should they desire any change? The matter presented by Dr. Squibb was not the action of this Association. It was a proposition for them to take possession of this matter themselves, to take it under their special control instead of leaving it to the convention which now has charge of it, and there was no particular reason why they should take any special action. I don't know that their action evinces any want of co-operation. Certainly we have offered no proposition as a body for them to co-operate in, and not having refused to co-operate, we can't censure them for not doing it.

MR. MENNINGER.—Neither the American Medical Association nor the American Pharmaceutical Association have anything to do with the revision of the Pharmacopœia under the existing modes of procedure.

MR. CALDER.—The medical associations of the country have controlled it.

MR. MENNINGER.—The medical associations have controlled it, but only a very few of them have sent representatives to the Pharmacopœia Council, and the American Medical Association has no representation. The proposition was that the American Medical Association, as representing the medical profession, and the American Pharmaceutical Association, as representing more fully the pharmaceutical profession, should take an interest in the revision of the Pharmacopœia. A gentleman asks, what right have we to tell the American Medical Association that they have neglected certain work? Sir, the right that every scientific man has to demand the co-operation of every other scientific man; the right is inherent in every man to demand his hearty co-operation of another who claims a fellowship in science. The Pharmacopœia is intended to govern both professions, and whom shall we apply to, whom shall we call upon, but the medical profession to co-operate with us? We have not only the right to call upon them, but it was our duty.

Mr. Calder.—I understand that the Pharmacopœia Convention is older than either of these Associations, but it was originally instituted by the physicians or delegates from medical societies throughout the country. It is only a few years that the pharmacists have been invited to participate in it. It has virtually been in the possession of the physicians, and why their action shows any want of co-operation I can't quite see. They already have the control of it.

Mr. Shinn.—This Association has a standing committee on the Revision of the Pharmacopœia. I suppose that the duty of that committee is to make all the suggestions in writing that occur to them that would advance the cause of pharmacy in the Pharmacopœia, and report to the convention, which meets next decade in Washington. I think that this subject of appointing a committee to decide whether they shall make out an entirely new Pharmacopœia might be left to that committee. It would be a good thing if they are willing to take the work, but so far as the reference to the American Medical Association is concerned, I think it will be more dignified for this body to say nothing about it, and to take an entirely independent action.

Mr. Ebert.—Mr. Shinn is mistaken when he mentions that we have a committee who are to make a report to the convention for the revision of the Pharmacopœia. Our committee would have no voice in that revision; we would be ignored, as they have ignored in the previous revisions every report that has ever been presented to them from any section of the land, except from the local section from which the Pharmacopœia Committee hailed. That is why we protest against this method of revision. Speaking for the Chicago College of Pharmacy, we worked for six months arduously in making a report to that convention, and there is not an item incorporated in the Pharmacopœia that hailed from Chicago. There must be very little intelligence among the pharmacists of that city if they could not advance one single idea to go into the national Pharmacopœia. There are necessities in all parts of this country that ought to be incorporated in that Pharmacopœia. I was a member of the final Committee on Revision, and I met the other gentlemen at Philadelphia. Let the whole country be represented, and not simply one section. I have the kindest feeling for that particular city, but I certainly ought, as coming from a different section of the country, represent it whenever I am called upon to do so.

Mr. Shinn.—Perhaps the chair can state what is the purpose of that Revision Committee appointed by this Association. What is to be done with their work?

Mr. Peixotto.—Is this discussion pertinent to the subject? We are discussing not the Pharmacopœia or the revision, but the wording of the preamble and resolutions.

Mr. Sheppard.—Dr. Hoffmann suggests the following modification of this preamble: "Whereas, The American Medical Association, after a full presentation of this subject and of a matured plan for action, at its recent meeting at Chicago, has failed to take any action in reference to the revision of the Pharmacopœia by indefinitely postponing the proposed project; Therefore, Resolved," etc.

Mr. Bedford.—That covers just the whole ground. Now there is no need of further discussion on that question. I think that meets the views of everybody.

Mr. Bullock.—I think we had better leave out any mention of the action of our sister Association What they did they did for themselves, and they did what they thought was right. I am willing to withdraw my amendment to save discussion, although I should rather have it the other way.

Mr. Bullock having withdrawn his amendment, the question was taken on the preamble and resolution, as modified, and carried.

The Auditing Committee, through Mr. Eberle, presented the following report, which was accepted:

September 6th, 1877.

To The Officers and Members of the American Pharmaceutical Association.

Gentlemen: Your committee, to whom was referred the annual report of the Treasurer, Charles A. Tufts, respectfully report the entire correctness of the same, after a full examination and comparison of books and vouchers, the balance unexpended being $954.39.

They believe, in view of the vast and continuous increase of duties in the interest of the Association, so courteously, correctly, and satisfactorily performed by that officer, requiring, in addition to large and constant demands upon his time, clerical assistance, at considerable expense to himself, the salary accorded him to be inadequate to the amount and value of the labor performed, and offer the following resolutions, viz.:

Resolved, That the report of the Treasurer be adopted.

Resolved, That the salary of the Treasurer be increased in the sum of one hundred dollars ($100).

Resolved, That a committee of five be appointed by the chair to devise means of meeting the increased demand upon the treasury, dependent upon the passage of the previous resolution.

Charles L. Eberle,
Edm. Gregory,
William H. Rogers,
Committee.

Mr. Menninger.—I move the adoption of the recommendation of the committee as to the appointment of a committee to consider.

Dr. Squibb.—In rising to second that motion, I would beg to express my hearty concurrence with the preceding resolution, namely, that the Treasurer's salary should be increased. I think if we only recognize the full value of the labor involved, there can be no question in regard to the passage of such a resolution, and the only argument that can be raised against it, is as to the means of the Association. No association can hope to get the labor of men, who are able to carry on its operations, without paying for them. There is

in the last resolution a desire to make some plan whereby the Association shall be able to pay these increased demands, as they come from year to year, and I hope the committee that shall be charged with the matter will present to us some plan of increasing our funds.

Mr. Eberle.—Notwithstanding there is an unexpended balance amounting to over $900, the Association must bear in mind that drafts have been made upon that sum already, so we are working constantly in advance of our income. The officers are under a considerable embarrassment, to sail as closely to the wind in the government of the finances as they are compelled to do. The labor which is so carefully and excellently performed by Mr. Tufts, is worth to any business man a great deal more money than he receives. It is largely a labor of love, and the intimation for an increase of salary has not come from himself. I believe any one who is engaged in active business would feel loath to accept the office for the emolument he receives, nor does he hold it for that, but is willing to give his services largely gratuitously to the Association. He is, at the same time, put to considerable expense in being obliged to avoid other duties of pecuniary benefit and value to himself, and while we do not propose that this increase of salary shall be given because it is required by the gentleman himself, yet he has other duties calling upon his time, which must be met and discharged by some other person, and for which he would willingly pay out of the salary the Association grants him. I believe the same rule would apply to other officers of the Association, but as our business only covered the business of the Treasurer, we did not allude to them.

The President.—This being an alteration of the By-laws, must lay over to a subsequent session.

Dr. Squibb.—I rise to make another suggestion, and ask Mr. Eberle to accept it; that is, that the last resolution be referred back to the same committee. The committee is in possession of the financial state of the Association, from having gone over the Treasurer's report. I cannot conceive of any better committee that the President could nominate than this one, to suggest at the afternoon session some means whereby this increased amount could be raised.

Mr. Eberle.—The committee considered this matter was so general in its character that a committee of three would be too small. It ought to be more representative, and they suggested five, expecting it might probably be increased beyond that amount.

Dr. Squibb.—If the Association chooses to appoint two more members on that committee, there can be no objection to that. Whether a large committee can do the work better than a small, is for the Association to judge.

Mr. Eberle.—The final resolution is dependent upon the passage of the second. A committee might not be able to arrive at a satisfactory conclusion unless they had considerable time, and intercourse with the officers in regard to the best plan to be adopted. Therefore, if this resolution was adopted now, it would not defeat the intention of Dr. Squibb, and if I am appointed, I

would much prefer it if we do not report until the next annual meeting. The resolution to increase the salary could be adopted, as the appointment of the committee is dependent upon the adoption of that resolution.

DR. SQUIBB.—I accept the suggestion in seconding the motion of Mr. Menninger, for the adoption of the committee's report, and I now suggest to Mr. Menninger to divide. Let us adopt the resolution increasing the Treasurer's salary at once, and then consider the other resolution subsequently.

THE PRESIDENT.—That would require to be done at the next session.

THE SECRETARY.—The last resolution might now be adopted, that a committee of five be appointed, and that committee might be reappointed with two additional members, in addition to the three of the Auditing Committee.

The resolutions appended to the report of the Auditing Committee, that the Treasurer's report be adopted, and ordering the appointment of a committee of five, were then adopted.

MR. CALDER.—I suggest that a resolution be offered instructing the Secretary or this committee to again communicate with those members who became life members under the old Constitution. Being one myself, I yesterday first knew of the fact what action had been taken in regard to the abandonment by them of their privilege.

THE SECRETARY.—That subject has been before the Association, and it was resolved to refer it to a special committee of three. Would it not be proper to refer the whole subject to this committee of five?

MR. CALDER.—I have no recollection of ever receiving any such communication as was mentioned by the Secretary. If I did, it was under a different conviction of mind from that which now possesses me. I, for one, would be willing to relinquish any rights I possess under the old Constitution, and I have, no doubt, many others might. I probably was not present at the meeting, nor do I recollect receiving a notification of that kind, and as I would be willing, probably some others might be of the same opinion.

DR. SQUIBB.—I would mention for Mr. Calder's information, that the matter was done in a very systematic way. Printed notices were sent out by the Treasurer asking the question. I drew up the design myself, and it was passed by the Association. Questions were put to each life member, which he was asked to answer, whether he would give up his life membership or not, stating to him at the same time that he had a perfect right to do one or the other; that the Association had no disposition to pass an ex post facto law in any shape or form, either in spirit or reality. These circulars were sent to all the life members. Perhaps the Treasurer will recollect more of the exact shape in which it was done. It was spread on the minutes, I think, of 1868.

THE SECRETARY.—And it occurs since that time repeatedly in the reports of the Treasurer and Secretary.

MR. CALDER.—I can only say I have no recollection of receiving it, but

as I say, I was of a different state of feeling then, and perhaps many others were, and it would be well to start it anew.

MR. EBERT.—Would it be advisable for the Treasurer to communicate with some active member in the larger cities, to personally appeal to the old life members to relinquish their life membership, and in that way aid the officers of the Association.

THE SECRETARY.—By vote of the Association it was resolved to-day that the proposition to amend the By-laws in reference to this subject of increasing the means of the Association should be referred to a committe of three. I now move that the whole subject be referred to the committee of five, that is to be appointed under the resolution just passed, and that the committee of three be merged into this last committee of five. Neither committee has yet been appointed, and it appears best that one committee should consider all that is germain to the subject of increasing our revenues.

The Secretary's proposition to merge the committee of three, under a previous resolution (p. 530), into the committee of five, the appointment of which was just ordered, and to refer to this committee all questions relating to the increase of revenue, was then adopted.

Mr. Markoe read a volunteer paper on Oil of Myrcia Acris, and exhibited specimens of the leaves, four samples of the crude, light, and heavy oils, mixtures of the last two with alcohol, some resinous residues and crystals of eugeniate of potassium.

The paper was accepted and referred (see page 435).

MR. MARKOE.—I would like to ask the indulgence of the Association to give me, say a month more, so as to give me time to study the light and heavy oil a little more at length. It took me the last six months to get the crude material to work upon, and it was only about a week before I started that I was able to accomplish these redistillations.

THE SECRETARY.—I should like to accommodate my friend Markoe, but as Permanent Secretary and editor of the Proceedings, I hope the Association will not entertain any motion to postpone the reception of papers. The results which Mr. Markoe has obtained are, so far, very interesting, and will serve as a preliminary paper. If he works at the subject another year, he will show us good results. In a month he could not thoroughly investigate the composition of the oil. In regard to the oil of bay, I may say that about twenty years ago it was scarcely known in Philadelphia. I have in my cabinet a sample which is more than twenty years old. It was obtainable at that time only in very limited quantities, and as far as I know, only occasionally from the West India Islands. The question in regard to the presence of eugenic acid was pretty well settled twelve or fifteen years ago. I cannot just now recollect the circumstances, but I have always taught that it contains that acid. The behavior of the oil to iron salts, and in the distillation, is precisely similar to that of oil of cloves, which likewise comes over in two different portions, as a light and heavy oil—the heavy oil consist-

ing of the eugenic acid. I do not know whether the bay leaves are usually met with in general commerce, but I know that they are imported to a considerable extent into the United States; large quantities, however, are used there for the distillation of bay rum, and, probably also, for the distillation of the oil.

Mr. Markoe.—I was aware that one firm was engaged in the distillation and manufacture of bay rum, by distilling rum or alcohol with the dry leaves, but I have not been able to ascertain that any firm is distilling the oil; at all events, the parties who control the sale of the bay oil don't know of that fact. So far as I know, I have been the first one in the United States to get the oil in any quantity. The similarity of this oil to oil of cloves is not at all strange, because the bay leaf plant is one of the species of the genus pimento. The fruit is very difficult to distinguish from allspice. I doubt, if I put two samples together, if many would be able to tell the difference between them. Probably the volatile oil distilled from the dried berries of the Pimento acris would be identical with that of the Pimento officinalis. I am in a position where I can probably get a quantity of the berries, and I propose to compare their oil with that of pimento.

Mr. Shinn.—I think the paper is complete enough to be printed without detaining the Secretary.

Mr. Markoe.—I don't mean to retain this paper, but I wanted permission to add some notes, which, if they were received in time, the Secretary could add. The experiments I wanted to make will not be in the direction of making an ultimate analysis, my object being to give the members the means by which they can have a standard to judge of the commercial oil. All the data we have in regard to bay oil have been based upon oils of doubtful purity. Rother stated that he had never been able to get the oil soluble in alcohol. That has been my experience with the commercial oil, but I find that my oil is perfectly soluble.

Mr. Bedford read a paper on White Wax, in answer to Query 12 (see page 444); it was accompanied by a large number of samples of yellow, bleached, and adulterated wax.

Mr. Bedford.—One of the samples has the appearance of yellow wax, but is ceresin as it appears in the market. The honey odor is entirely wanting, but otherwise it is one of the best deceptions to the eye. Ceresin is a fossil paraffin, found in Austria. My impression is that it is not artificially colored; but it may be bleached, and among the samples shown will be found some of this article and of its admixture with wax.

Dr. Squibb.—In regard to the ceresin, it is doubtless a fossil paraffin, dug from the ground, and undergoes a preliminary purification at the mine before being sent into the market. Many years ago I tried to get a prominent manufacturer of white wax to abandon the word white and call it sun-bleached, but without success at the time, because it would obstruct the sale of it. But one of the best tests I know of for "white wax" is its not

being white. If wax has the color of the ordinary pure cakes now being passed round, and has the peculiar edges, I would think it pure, but would not be certain. The name of the manufacturer is the best criterion. The specific gravity test is, in my opinion, fallacious. Paraffins can be had of any specific gravity; therefore, as an adulterant of white wax, it is very easy to obtain the required specific gravity. The best judges of pure wax, so far as I have heard, have been the flower-makers and the Catholics, who use it for candles. The circumstance mentioned by Mr. Bedford, that sun-bleached wax does not suit the flower-makers is new to me, because I have heard they had a way of making it of any degree of consistence they required, but required pure wax to do this. I have seen the process abroad of making the wax into the various degrees of hardness which the flower-makers require, but it is possible the practices in this country may be different. The flower-makers abroad are the best judges of pure wax. The fact of the demand for white wax stimulating the manufacturer to make it white, involves a curious story. One of the best manufacturers of pure wax, finding he was being undersold by this composite mixture of wax and other substances, borrowed the name of his brother-in-law, and made an adulterated, but white wax, and sold it under this name. This wax suited the market so well in whiteness and in price that he very often had it quoted against himself as being a great deal better than his own pure bleached wax, with the question why he could not make such wax.

Mr. Bedford.—It is known that paraffin can be had in any kind of hardness, of varying specific gravity; but, in regard to the ragged edge, I think it will be seen that it is not any criterion at all, because these specimens of manufactured wax being made in the same moulds, have a ragged edge. They were made for me by a manufacturer in his own wooden moulds.

Mr. Shinn.—I have seen turned out many pounds of sun-bleached wax from tin moulds. There was no difficulty in moulding, I may almost say, tons of it. The moulds were made of flat pieces of tin with rings soldered on, which were filled, and the wax, when cooled, was taken out.

It was stated that the flower-makers in Canada use Canada balsam to adulterate wax to make it suitable for their purposes.

Dr. Squibb.—It is information and not knowledge I am giving in stating that the flower-makers had admixtures with some of the thick oils which they melted with the wax to make it of any definite stiffness or flexibility they desired; that they themselves were excellent judges of the purity of the wax, and themselves made it to suit their own purposes.

Mr. Ebert.—Is there any agent used in bleaching wax except that of sunlight?

Mr. Bedford.—No chemicals are applied so far as I know. The wax manufacturers say it does not succeed, and they cannot sell wax bleached by chemical processes. It is spread out in the field to bleach in the manner I have shown.

MR. MARKOE.—Several years ago I visited a wax manufacturer located in the city of Syracuse; and he took me through his manufactory and showed me all the processes, and when I asked him if he used any chemical agent, he said he used sun-bleaching so far as he could, and then finished it by the judicious use of chlorine gas.

MR. SHEPPARD.—How long does it take to bleach wax?

MR. BEDFORD.—Twenty-four to seventy-two hours' exposure. It is then cast into cakes and put into little layers directly in the sunlight under glass.

MR. REMINGTON.—Four or five years ago I had one of the first samples of ceresin that came to this country. I examined it and published the results in the "American Journal of Pharmacy." It is also known under the name of ozokerite, and is nothing more nor less than a form of paraffin. My experiments at that time differed a little from Mr. Bedford's in this, that I found fuming Nordhausen sulphuric acid to be a better test than ordinary sulphuric acid, without applying any heat at all.

Mr. Remington read a volunteer paper on Hydrobromic Ether (see page 454), which was accepted and referred.

The chair appointed the following committee to consider and report upon the Pharmacopœia question: M. L. M. Peixotto, of New York, Joseph P. Remington, of Pennsylvania, G. F. H. Markoe, of Massachusetts, A. E. Ebert, of Illinois, and T. Roberts Baker, of Virginia.

The Association then adjourned until 3 o'clock this afternoon.

Fifth Session.—Thursday Afternoon, September 6th.

The meeting was called to order at 3.15 P.M., President Saunders in the chair. The minutes of the fourth session were read and approved.

The Business Committee called up the subject of increasing the Treasurer's salary, as proposed by the Auditing Committee (see page 539), and moved that Article IV, Chapter IV, of the By-laws, be amended by striking out the figures 400 and inserting in place thereof 500. It was carried without opposition.

Vice-President Ingalls took the chair, when Mr. Saunders read a paper on Eau de Cologne (see page 418), and exhibited several samples of the article made by the proposed formulas. The paper was, on motion, accepted and referred.

Mr. Menninger.—What kind of alcohol do you use?

Mr. Saunders.—Gooderham & Worts's pure spirit; 65 over proof by Sykes's hydrometer. It is what we know in Canada as deodorized alcohol, 95.

Mr. Menninger.—I would like any one here, who is fully conversant with the process employed in deodorizing alcohol, to give us some light upon the subject. I heard it stated by Mr. Reichard, at a meeting in New York, that the principal difference between the 95 per cent. alcohol and that sold as cologne spirits was in the label. Undoubtedly there is a pure alcohol, but whether that which is sold in the market as cologne alcohol is any purer is a question.

Mr. Gregory.—There is considerable difference between the ordinary commercial alcohol and what is known as deodorized alcohol, but I don't know the way in which the latter is produced.

Mr Saunders.—They deodorize it by passing it, in a state of vapor, through a bed of charcoal.

Mr. Menninger.—What essence of jessamine does Mr. Saunders use?

Mr. Saunders.—I obtained Warwick Bros jessamine pomade and prepared the essence from that; but I have bought the English, I don't know whose make it is, and it answers equally well.

Dr. Squibb.—What are the objections to the addition of acetic ether to cologne waters? For sick persons, as an addition to cologne waters, it is extremely refreshing and invigorating. I have known it to be used, but always on extemporaneous prescriptions. In some parts of the country it is quite a common practice, and I have heard it spoken of as exceedingly useful. I think the proportion is half an ounce of the ether to a pound of cologne water. Of course, the quantity will depend upon the object for which it is to be used. In cases of typhoid fever, where cologne water becomes exceedingly useful and is really a medicament, the ether would be required in a larger quantity, but I think the addition of a small quantity would give the cologne water a characteristic property which might make it more useful. In reference to the deodorized alcohol question; so far as I know, the name of deodorized alcohol originated in the alcohol market at the time when the Atwood patent first went into operation in Boston. That became known as deodorized alcohol. It was deodorized by manganate of soda, and the only peculiarity about it was the extremely clumsy way in which it was done by the original patent. This, I presume, has been improved, and probably permanganate of potassa is used. Only alcohol deodorized by permanganates is properly deodorized. I have been informed that that which is sold as deodorized alcohol in the

New York market is made in two ways. In the first way, one of the enormous stills that delivers from eight to sixteen gallons a minute during the term of its running, is charged, and the first half day's run is clean enough to be sold as deodorized alcohol. Then, as weak spirits or high wines are fed into the still as fast as required, the alcohol becomes less clean. These stills have to be cleaned out occasionally to make ordinary commercial alcohol. If run indefinitely, the alcohol will be so foul that it can only be used for few purposes, and it is better to let the still run down and recharge it, when again they get half a day's run of very fine and strong alcohol that will sometimes exceed the officinal stronger alcohol in strength and will equal Atwood's deodorized in cleanness. That is the alcohol, so far as I know, that is sold as the cologne spirit of the market. Another plan is that named by Mr. Saunders, by running the alcohol vapor through charcoal or coke. The alcohol so prepared is not so clean as the first run of a recharged still. I am giving derived information, just as near as one can get to the usages of the large makers of alcohol. My practice is to select the alcohol for making ether from the cleanest and highest grade, because unless you get a clean alcohol you will not have a clean ether as the result of the reaction of the sulphuric acid. It is not always that twenty barrels of such alcohol can be had, and the manufacturers then say wait a few days, to get this particular kind; and the explanation made is the reason the dealers have given.

Mr. Markoe.—Dr. Squibb has alluded to the Atwood patent. I am well acquainted with the parties who work under the Atwood process; they use crude manganate of soda, and the alcohol made under this patent they don't consider equal to that which they call French cologne spirit, made from high wines diluted with water and run through tanks filled with charcoal. They sell as deodorized spirits only the first part of the run, the other being turned into the common use. So far as my observation and practice are concerned, I prefer the so-called French spirit to the Atwood, as being cleaner and better adapted for use in perfumery.

Mr. Saunders.—On the use of acetic ether in cologne, I have no experience at all to offer. I have no doubt the addition would be very refreshing in cases of sickness, but in the formula that I have presented I don't think it would be a useful addition, because it would not be so pleasant as a perfume and might not be so useful as an addition to lotions for the purpose of perfuming them, but I have no doubt it would add to its refreshing qualities in the sick-room. As to the alcohol question, the difference in price between Gooderham & Worts's ordinary alcohol and deodorized, I think, is three cents an imperial gallon, and as it is obtainable always and at any time, it cannot be obtained in the way in which Dr. Squibb suggests. I have always understood it was purified by passing the vapor through a bed of charcoal.

Mr. Menninger.—I have used acetic ether in cologne for some time, but I think the quantity stated by Dr. Squibb would be too large for the ordinary cologne. Of course much depends upon the essential oils used in the cologne. I have been in the habit of using one ounce to the gallon, which I think is plenty. Otherwise the acetic ether is too prominent. I mention this because

while experimenting I had used too much acetic ether and had to make a larger quantity of cologne to overcome the difficulty.

Mr. Ebert.—As to the practice in the Western market in regard to making this cologne spirit, I can entirely corroborate what Dr. Squibb says. That is the practice of the large distillers in Chicago, and Chicago is a point for making alcohol—I think the largest in the country. The alcohol of the first run is all reserved and sold as cologne spirits at five cents a gallon more than for the balance. Lately the manufacturers of alcohol have been drumming up the retail trade, wishing to sell this alcohol at the advance named, and pretending that it had been reserved for druggists' use as being equal to French spirit. A friend, who is connected with the distilling business, told me that sometimes they would obtain larger quantities of this clean spirit than at others. What the reason was he didn't state, but said it was the first run in rectification.

Dr. Squibb.—Always in the winter they get more through the coldness of the water used for refrigeration.

Mr. A. W. Miller read a paper on Confection of Senna (see page 398), in answer to Query 5, and exhibited samples of the article.

Dr. Squibb.—Cassia fistula is easily found. To me the objections to it are of another character, namely, the difficulty of exhausting it and obtaining the pulp. It can be done, but it involves the grinding of the shell previous to exhausting the pulp with water. What I consider to be important in confection of senna is the quality of coriander ; unless good, and containing sufficient oil, the confection suffers. It becomes an imperfect preparation, and griping is not prevented. I have more trouble in finding good coriander than any of the other ingredients, and it is almost impossible to get it into a fine powder, unless ground together with the senna. This being dry, absorbs the oil from the coriander, and an impalpable powder may be obtained. For some years I have considered it quite an important improvement in making confection of senna, to grind the two ingredients together. If the purging cassia be large, it will yield a very different proportion of pulp from what it will if small. We often see it in the market not much larger than one's thumb, and again, about half to more than twice as large as that. The larger purging cassia often contains a larger proportion of pulp, and therefore, as the pulp will vary with the size of the cassia, it would be a great improvement to the formula, if the pulp could be weighed separately, and the formula directed it in a fixed proportion. I have been making confection of senna for many years, and know of no nicer medicament for many of those who are troubled with constipation; ladies can take it easily, and if an exact preparation, it does not require the dose to be varied. Another point is the liability to mould, which has been a serious drawback to the preparation. Of late years I have prevented this entirely by the use of glycerin and oil of cloves. The way I manage is to dissolve in five parts of glycerin, one part of oil of cloves, and then saturate pieces of paper with this mixture, and lay them on top of the confection of senna when in the pot, then the cover is put

on. This protects the confection. The oil of cloves is a very nice aromatic, and has an effect similar to coriander. I have never seen any mould upon the confection so managed, even in half-filled pots, provided these pieces of paper were continually kept in them. It is not necessary to place the paper close over the surface, but lay it in the pot. The glycerin very tenaciously holds the oil of cloves, and its presence in the pot seems to protect the confection from the growth of the mould plants.

Query 6, on the Value of Benzoin and Storax for preserving ointments, was called up.

Mr. Grahame.—I regret to be under the necessity of acknowledging myself a delinquent, contrary to my usual custom in such matters. I accepted this and another query, with the full intention of being prepared with answers at this meeting, but various circumstances connected with my business caused me to defer the necessary investigations, from time to time, until I had not the time to decide the questions. I have requested the chairman to have them continued to me for next year, and will be prepared with an answer.

On motion, Queries 6 and 9 were continued to Mr. Grahame; also Query 1 to Mr. Sharples, at his request, expressed to the chairman of the committee.

Mr. Mattison read a paper on Salicylic Acid (see page 461), in answer to Query 42.

Mr. Kennedy.—Did Mr. Mattison experiment with the solubility of salicylic acid in glycerin? If so, I would like to know the quantity that glycerin will take up.

Mr. Mattison.—I don't know the quantity. There is another query on the solubility of salicylic acid, and supposing that to be answered I didn't go into the matter.

Dr. Squibb.—I desire to correct one statement in the paper that seems to have escaped the author. He states that for medicinal use none other than the crystallized or dialyzed salicylic acid should be used, as they are purest. In my experience, the sublimed is purer than either. The purity of the crystalline depends upon the menstruum from which the salicylic acid has been crystallized. As one menstruum or another is used, it comes out purer or less pure. The dialyzed acid contains almost always about 8 to 10 per cent. of impurity, while the sublimed does not contain more than one-half of 1 per cent. When four pounds, the usual charge which I take at a time, of dialyzed acid is placed in the subliming apparatus, we usually lose by a residue of dark substance, about 10 per cent.; but there is some loss of vapor in the subliming process; therefore, it is not fair to charge the whole loss to the impurity; but that there are impurities, and that they are considerable, is evident to any one who undertakes the process. Kolbe stated it could not be sublimed, and his statement for a long time was accepted as being true, but

accidentally spilling some in a steam kettle, I thought I would try the subliming process, and it sublimed readily. With steam it can be sublimed as easily as benzoic acid. All the acid I have sold lately, and it has been a great deal, has been sublimed, and for medicinal use it is the best. One other point. I have found salicylic acid a most excellent and convenient substance for the prevention of growth of microscopic plants in solutions of alkaloid salts. I have on my table now six bottles of solutions of atropia, 2 or 4 grains to the ounce, in which I placed different proportions of a solution of salicylic acid. The readiness with which the solution of salicylic acid of definite strength can be made is very convenient. If any one will take 1 part of salicylic acid to 200 of hot water, it will dissolve by shaking, and on cooling the excess falls to the bottom, and remains there as crystalline acid. The liquid remaining is a saturated solution of salicylic acid, at the temperature at which it is used, but it varies considerably with the temperatures. In summer temperature, the water will hold considerably more than in winter. Now this solution, that is always clear, is convenient to add to solutions of alkaloid salts. I began with 5 cubic centimetres to 60 cubic centimetres of solution of atropia. The next was 5 in 30, then 7½, then 10, 12½, and 15, or half of the whole quantity of the solution of sulphate of atropia. These bottles were prepared in May, 1876. They are now a year and a quarter old, and in but one has any growth taken place. I have been careful to take out the stoppers and leave them out over night a great many times during the year, to give these solutions every opportunity to be inoculated with the spores of these microscopic plants. The one where the growth is did not change for months, not, I should say, under six months, while a solution of sulphate of atropia unprotected had growths within two weeks.

Mr. Wellcome.—I should like to ask Dr. Squibb if he regards the combination of this acid with sodium, potassium or other salts, as impairing the therapeutic value of salicylic acid.

Dr Squibb.—It is said that the salicylates are equally effective with the acid, but that as soon as the acid is converted into a salt it loses its antiseptic properties, and its properties for preventing growths. The salicylate of sodium has been proved to be as effective in fevers in reducing temperature as salicylic acid itself, while more agreeable to the stomach. The effect of salicylic acid and the salicylates on the reduction of temperature, is about as certain as anything in therapeutics.

Mr. Mattison.—I am indebted for this information, and will make the correction with pleasure.

Mr. Diehl.—Some two years ago Rautert published a process for subliming the crude salicylic acid.* I would like to ask Dr. Squibb whether he is familiar with that process. It consists in passing steam over salicylic acid heated in a retort or copper vessel to a temperature of 338°. It is interesting to know whether the statement there made is correct. He states that shortly after the passage of the steam, the vaporization of the salicylic acid

* See Proceedings, 1875, p. 376.

is so rapid, unless the neck of the retort or still is very wide, it has to be kept open by passing a rod up and down the neck. Then I would like to know whether Dr. Squibb has any experience with the distillation of salicylic acid of the market; why it is necessary to resort first to the process of dialysis, or to use an acid that has already been subjected to this purification process, in order to obtain it more pure; whether it is any better, or whether the same results cannot be obtained by using the crude acid direct.

Dr. Squibb.—I have no experience with the distillation of salicylic acid; it is entirely new to me. In regard to the other question, as to why take a pure salicylic acid rather than an impure one for sublimation, that question was settled in my early experience when I made salicylic acid. I was a maker of it by Kolbe's process until an American patent was taken out, when I ceased to make and began to import it. In that experience I found it very much more economical to purify the acid by recrystallization before it was subjected to sublimation. That is to say, if you put four pounds, for a charge, of impure acid into the subliming apparatus, and that is only, say three-fourths of salicylic acid, you are occupying your apparatus for the twenty-four hours to a disadvantage; but if you put a purer article in you get more out, and your time, steam, and labor are given to a larger amount. I have repeatedly since that time tried that, by importing the different grades, and have settled down to the fact that the most economical was the highest, and have used none other for a year or more. I have no data here, and merely offer some loose information from memory. Of the ordinary crude salicylic acid, such as is precipitated by the hydrochloric acid, and washed simply, every one hundred pounds will yield about seventy-five pounds of sublimed acid. Then the amorphous acid gives about 85 per cent., and finally the dialyzed, about 90 to 92 per cent. I don't think I ever got more than 92 or 93 per cent., but this is merely memory, as I have not the data with me. Now when you compare the results of the pink and amorphous and dialyzed acids, you find the dialyzed is the cheapest, and therefore it is a mere matter of cost. If I remember aright, the crude pink acid costs about $3 to import, whilst the amorphous does not cost more than $3.15 or $3.20, and the dialyzed does not cost over $3.50 or thereabouts in one hundred kilogram lots, and the difference in yield makes the last the most economical.

Mr. Diehl.—I understand Dr. Squibb to say he discovered the acid could be readily sublimed by some of it dropping into the steam-kettle. I infer that a portion was vaporized by the agency of the steam, that the steam exercised an agency in vaporizing it, and I understand, therefore, that Dr. Squibb's method is not one in which he uses steam as an agent in driving over the acid.

Dr. Squibb.—By dropping it into the steam-kettle, I meant a jacketed steam-kettle. I saw the vapors come up when the steam was turned on, and soon found out the temperature at which it would sublime by the use of steam in the jacket. The probable reason for Kolbe's statement that it could not be sublimed was that it was attempted by the heat of a fire, which could not be regulated with sufficient nicety. I sent specimens abroad to show that

this statement was erroneous, but never had any reply or acknowledgment, and have seen the statement repeated since that it cannot be sublimed. The subliming-kettle is a round cast-iron kettle of four feet diameter, an inner and outer kettle, bolted together, to admit the steam between the two. Upon the top is placed a paper and muslin hood. A frame of wood is made and surrounded with muslin, and paper is pasted over, merely capped with thin paper on top of the muslin, so when the first effect of the steam is had upon the salicylic acid the air can escape without breaking the paper, that is to say, it goes through the thin paper. Across the top of the iron kettle is placed a diaphragm of muslin; that is not intended to strain the vapor, but to prevent the sublimed acid from falling back on to the heated iron. I have ascertained there is no acid condensed below that diaphragm, that is, that the whole temperature of the chamber is always kept above the subliming-point, just as it is with benzoic acid. The vapors condense in the most beautiful form in the muslin top.

A paper by Mr. D. Hayes, On the Effect of Certain Salts upon the Solubility of Salicylic Acid (see page 465), in answer Query 20, was read by Mr. Peixotto.

Mr. Diehl.—Of all the substances I have employed to promote the solubility of salicylic acid, I have found acetate of ammonium to be the best. It takes a comparatively small quantity, and by making a very concentrated solution of the acetate, such a one as would be obtained and as I am in the habit of keeping on hand by saturating the acetic acid with carbonate of ammonium, you can dissolve much salicylic acid and mix it with other medicinal aqueous solutions, elixirs, or other liquids.

The Permanent Committee on the Pharmacopœia asked leave to present a verbal report, and the chairman spoke as follows:

Mr. Bedford.—The Permanent Committee on the Pharmacopœia has been completed about three years. During this time it has been almost impossible to get a goodly gathering of the members until last year, and then many of them were so much occupied with the Centennial Exposition that but little business was transacted. The main business that has been done was laying out the work, and some few details have been done by a sub-committee in New York. From a number of the gentlemen I have had no response, and of the fifteen but six are present here. The work that has been done opens the way, but has not been satisfactory to the committee. This is owing to their inability to communicate well with each other, and they feel somewhat disheartened, the chairman especially. In the early part of the year a circular was issued to every member of the Association inviting responses or suggestions, etc., to which the answers have been either way you may put it, homœopathic or microscopic. Scarcely any replies have been received for suggestions, alterations, or amendments, but the committee have done some work. In view of the discussion that is taking place in this and other associ-

ations on the Pharmacopœia, in view of the manner in which it stands now before this Association, we desire that something shall be done. A resolution has already been offered looking to something of that kind, and after consulting with my colleagues, who are present in this Association, we desire now to tender the resignation of the members of that committee, with the hope that something will be done by the appointment of a new committee, in such a manner as will be more satisfactory and for the better interests of the Association. It is believed that that can be done by carrying out the resolutions that were presented this morning, and in view of all these circumstances it is the desire of the committee to relieve the Association, so that the way may be opened for another work. The committee, if I remember rightly, was appointed originally a number of years ago, completed about three years ago, and as it now stands it has only to prepare a report to be presented for action in this Association, and after such action to be presented to the National Association. The resolutions which were presented this morning look to the preparation of a more complete work than this committee is empowered to do, and in order that there shall be no want of ability for the Association to carry it out, it is the desire of those present that the committee be relieved. It was appointed and intended as a permanent committee, but I believe that is the best way to open the field for the work as it is desired and as it should be accomplished. There are some in our Association who are not on this committee that certainly ought to be, and as it is at present composed it cannot represent as fully as it might the desires of this Association. I therefore take pleasure, in behalf of my colleagues and myself, in tendering the resignation of this committee.

Mr. Rice.—To bring this before the Association, I move that the resignation of this committee be accepted, with the thanks of the Association for the labors they have performed.

The Secretary.—Since that subject is now before the Association, I rise to say that I received yesterday, from the California College of Pharmacy, a paper which is addressed to the President and members of the American Pharmaceutical Association. The Secretary wished me to state to the Pharmacopœia Committee, in desiring this to be presented to the Association they did not mean any slight to the committee, but merely because great publicity had been given to the rules, etc , adopted by that committee. If it is the pleasure of the Association I should like to read the letter.

The motion of Mr. Rice to accept the resignation of the committee with thanks was carried, after which the Secretary read the letter from the California College of Pharmacy, which was, on motion of Mr. Sheppard, received and laid upon the table for further consideration.

Mr. Peixotto read the following report:

The committee appointed to consider the proposition contained in the resolution offered at the previous session, to the effect that the American Phar-

maceutical Association prepare a Pharmacopœia which may be submitted to the criticism of the medical and pharmaceutical professions, and proposed to the final Committee of Revision of the National Convention, report that they believe that such action is advisable at this time, and they offer the following rssolution :

Resolved, That this Association appoint a Committee on the Revision of the United States Pharmacopœia, consisting of fifteen members, who shall, by a plan to be determined by themselves, be instructed to prepare the text of the proposed new Pharmacopœia, and that they report progress at each subsequent meeting, and finally lay before the Association, at its meeting in 1879, a complete result of their labors.

M. L. M. Peixotto,
Joseph P. Remington,
G. F. H. Markoe,
T. Roberts Baker,
Albert E. Ebert.

On motion of the Business Committee, the report was accepted, and it was further moved that the resolution contained in the report be adopted.

The Secretary.—I have not the slightest objection to the appointment of such a committee, but I cannot let the opportunity pass by without stating my conviction that the labors of such a committee will be, in my opinion, of comparatively little value, because of little unity, unless that committee could have very frequent meetings. The revision of the Pharmacopœia is by no means an easy matter, and those societies who have heretofore contributed to that work know a good deal about the labor. If the large committee which is intended to be appointed under this resolution is to come from different parts of the country, the committee will labor under the same difficulties that the former permanent committee did, they will not have an opportunity to meet except for an hour or two at our annual meetings, and the result of their labors will be individual rather than united labor. Mr. Ebert stated that the Chicago College committee labored for six months. The Philadelphia College committee labored for over two years, and experience shows that frequent meetings are necessary to harmonize the different views. They can accomplish a great deal, however, if they succeed in agreeing upon the general principles that should be carried out in revising the Pharmacopœia.

Mr. Remington.—You will observe that the resolution leaves the work of this committee of fifteen to be decided by themselves. The facts which Prof. Maisch has brought out were taken into consideration. It was believed if this committee got together and were properly appointed—and the committee will have to be very carefully—that a plan could be developed by which a harmonious and judicious action could be fixed upon, and that is the reason why the resolution left it open that they should develop a plan among themselves. It does not seem to me to be an insuperable difficulty, and as I said before, it will depend upon the composition of the committee and the way

they go about it. I believe a committee could be appointed who would develop a proper plan.

THE SECRETARY.—I wish to be understood that I am not opposed to the resolution. I am merely stating my conviction as to the result.

MR. SHEPPARD.—If I understand Mr. Remington aright, he means to state that this committee will have the power to meet and then delegate its powers to a smaller sub-committee, perhaps three, if necessary, leaving the remaining twelve merely to be ready to offer suggestions.

MR. REMINGTON.—They can appoint a final Committee of Revision for themselves if they choose. Here is a large committee of fifteen. They can meet, put their views together, and then appoint a final Committee of Revision, who will collect and collate all their views, then call a meeting and have it submitted to them, and let it come as the sense of the whole fifteen.

MR. EBERT.—The object of making the committee so large was to cover as much of the territory of the country as possible. A man from California might be appointed on this committee who would form a sub-committee of the college there, and report on the medicinal drugs of California. The intention was to get material in that way, the action then being submitted to a small committee, who shall do the work close together, but in the way I have mentioned getting the material to do the work with. That has been the object of having a large committee.

MR. KENNEDY.—I believe the thing could be managed very well with a committee of fifteen if the work was divided up into sections, say into five parts, having each three from as near the same place as possible to do the work; each section might have a chairman, the members to report to the chairman, and at the end to compare notes. In that way they could very easily arrive at some definite conclusion. The great object will be to get workers. If you get workers I think the work can be done no matter where they are, whether they are in California or Canada, or wherever they are. If men who are not workers are on the committee there will be nothing done, and it will fall to some one, two, or three, but if there is a good selection it is my impression, and I think I am correct, it can be done easily.

MR. RICE.—I think we shall have no difficulty in getting men to do the work. It will perhaps be better to go carefully over the list of members, selecting them so that at least two of the committee, living within hailing distance of each other, may work together. The work can be easily divided up into five parts, or even more parts, and if a general plan is decided upon the work can be done. The Association might modify the book in the end. It is better, though, that the pharmacists should offer to the Decennial Convention a single volume than that each college should offer one which this convention would be asked to examine and make one out of eight or ten. Each college of pharmacy will perhaps appoint a Committee on Revision, which may contain among its members one man whom this Association has appointed as a member of our committee, and who may be Chairman of the Committee on Revision of that college, and he can in some measure direct the

labors of the committee of the college in the same channel in which his work ought to run, and in that way we can all help together.

MR. MENNINGER.—I have full faith and confidence in the plan proposed, and I see no obstacle in the numerical strength of this committee, for the reason that our Proceedings, our meetings during the last ten years, give evidence that we will not lack material in furnishing fifteen men from this Association who will take an interest in this subject sufficient to give it time, labor, and attention, and we also have among that material the men who can systematize their labor in such a manner as to prove satisfactory ultimately. I think the details of this plan had better be left to this committee. At the same time I think the selection should be left with the President, not only as to the geographical locality of the members, but as to the capacity and ability of the men. If you resort to volunteers in this matter, you will have to place a restriction upon volunteering, and require our volunteers to pass examination.

A MEMBER.—What is to become of this volume if it is rejected by the National Association ?

THE PRESIDENT.—I believe the committee do not anticipate such a result. That is to be left for future determination.

MR. REMINGTON.—That might possibly happen. I don't know whether the gentleman is acquainted with the constitution of membership of the two bodies. The National Convention has delegates from the different colleges of pharmacy in its membership. The American Pharmaceutical Association is composed of delegates from the various colleges of pharmacy and other associations, and of many pharmacists not members of any local organization. Most likely, the colleges of pharmacy being represented in both bodies, a report which would be acceptable to the American Pharmaceutical Association, would, no doubt, present the same features as the individual reports going to the National Convention ; and hence, they would agree to a very great extent. Now it is hardly likely that those who form the National Convention, the physicians and medical colleges, would throw overboard the Pharmacopœia as revised by the American Pharmaceutical Association, which has received the sanction of the various colleges, who are also represented in the National Convention, although such a thing might happen.

A MEMBER.—What has been presented before by pharmacists and pharmaceutical societies has been thrown overboard.

MR. EBERT.—The difference would be that these reports have come separately from the colleges, each college having made an individual report without any consideration of the report of any other college of pharmacy, so that our reports may have been very conflicting ; but if we work in this way we will have but one report, which will be in harmony with all the colleges and pharmaceutical societies of the country.

THE SECRETARY.—Does Mr. Ebert mean that after adopting this resolution the colleges should not revise the Pharmacopœia ?

MR. EBERT.—Not at all, but only in harmony.

THE PRESIDENT.—This looks to the preparation of different sheets to be submitted to the colleges of pharmacy and medical colleges, and be returned to the committee with such criticisms as they receive, to be gone over carefully, before being presented to the Association, so they shall embody the different criticisms, and the report meeting the approval of the Association, be finally presented to the Convention of Revision, at Washington, in 1880.

The resolution of the committee directing the appointment of a Pharmacopœia Committee of fifteen was carried unanimously, and on motion, the communication of the California College of Pharmacy was referred to this new committee.

Mr. Gregory read a paper on Emulsion of Almonds (see page 412), in answer to Query 56.

MR. SHINN.—It would be interesting to know how much emulsion of almonds is used in the various parts of the country. I think two quarts would supply the whole United States for one year.

MR. EBERT.—Mr. Shinn is mistaken.

MR. SHINN.—In Philadelphia it is rarely used.

THE SECRETARY.—Mr. Shinn is mistaken in that.

MR. EBERT.—I have had some years' experience in making emulsion of almonds, and I have found the mode of performing this operation that has been suggested in works like Mohr's and Hager's is the best. In every German pharmacy they have a brass mortar holding from a quart to three pints, the pestle of which is of brass, having two flat surfaces, there being a heavy, flat, rounded surface at each end of the handle. You can use either end of the pestle for trituration. The blanching of the almonds is performed by the use of a little warm water, leaving the almonds there for a few moments, and upon taking them out the skin is very easily removed. They are then placed in the mortar and pieces of crushed sugar are added, usually half an ounce to an ounce of almonds. Very little water is now added, and one of the flat surfaces of the pestle is placed under the thumb and raised up and allowed to fall down, and in moving it up and down the figure 8 is made. It is a very easy manner of working the pestle. In that way, in a very short time, the almonds are triturated to a very fine mass, after which more water is gradually added, and a uniform mixture is produced, which is then strained. I have made it very often, and have found no difficulty in making it in a very short time, and the almonds always seemed to be pretty thoroughly extracted of the oil.

MR. GREGORY.—I think it is adding the water in that case that prevents the raising of the oil. I have repeatedly tried to make emulsion by adding the sugar. I always found I got an oily mass, not very oily, but stained with oil, but if you add the water you avoid this. I should rather use a Wedgwood or marble mortar than a brass one. The effect of a brass sieve was to turn the emulsion. The plan I pursued was to use boiling water for blanching the skins.

Mr. Wellcome.—It is customary to use a wet towel, to rub the almonds thoroughly to remove the skin, which contains a little coloring-matter, and for preparing small portions of the emulsion it serves very well. If the emulsion is allowed to remain for some time in contact with the brown skin, I should judge it would get colored, but when made as stated, I have seen it as white as that from the blanched almond. I have known some to use hot water, and leave in the almonds so long that they were cooked through, which spoiled the emulsion.

Mr. Remington.—I should like to ask if Mr. Gregory has ever tried making a confection of almond that would keep, so by taking a small quantity of confection and shaking it up with water an emulsion could be made?

Mr. Gregory.—I have never made the experiment. The demand for emulsion is not very active with me. The next time I shall try the fact recommended to me by this gentleman. He states that blanching them in cold water renders them very mealy, and oil does not rise. The almonds after blanching and peeling are dried in warm air. He says then they powder easily; but even then they could not keep the emulsion more than three days. At that place the trade is very fashionable; they serve the nobility of England, who don't care for the price.

Mr. Sheppard suggested that members be prepared to appropriate some money for defraying the necessary expenses of the Pharmacopœia Committee.

The President announced that he would now appoint the committee to consider and report upon the ways and means for increasing the income of the Association.

Dr. Squibb.—I would suggest whether the Treasurer and Secretary should not be appointed to act with that committee. We are constantly wanting money, and our expenses are constantly increasing. Here is an expense created by this Pharmacopœia Committee. We have taken steps to raise a Centennial Fund, which, so far as I am concerned, I would rather see go into the current wants of the Association, than have it put out at interest for the present; but now, the question being to raise funds for the ordinary and extraordinary expenses of this Association in the future, I suggest whether the Treasurer and Secretary should not be the other two members of that committee, besides the three who have considered the subject at this meeting.

The President.—I shall be happy to act on that suggestion.

Mr. Gregory.—I am altogether too young a member to take any serious part in a matter looking back so far as this. I have attended one meeting previously. I shall be glad to be relieved if the Association is willing, but shall serve if required.

Dr. Squibb.—I, for one, would think Mr. Gregory to be the very man wanted.

The committee was appointed as follows: Messrs C. L. Eberle, of Pennsylvania; E. Gregory, of Ontario; William H. Rogers, of New York; Charles A. Tufts, of New Hampshire, and John M. Maisch, of Pennsylvania.

Dr. Pile read a volunteer paper on Dialyzed Iron (see page 452), which was accepted and referred.

Dr. Pile.—Many stores in Philadelphia sell parchment-paper which seems to be merely paper that looks like parchment. I tried it, but found it tore when immersed in water, as it could not bear the weight. The best parchment-paper used by me, was made in London. Some parchment-paper was very susceptible of mould, the portion projecting above the water becoming covered with mould in four or five days. I find that I did not correctly understand how far to carry the drying of the dialyzed iron; by drying it at a red heat much less is left than merely drying it at about the boiling-point of water.

Mr. Diehl.—I am somewhat surprised at the low specific gravity which Dr. Pile gives in his paper for a preparation containing 5 per cent. of oxychloride of iron. The specific gravity that has been given by all of the authors I have found, in the various formulas, was 1.046 for such a solution. In my Report on the Progress of Pharmacy I have alluded, to some extent, to dialyzed iron. I have made no experiments myself, but some have come to my knowledge and will be published in the course of a few months, which will throw some further light upon the subject of dialyzed iron and upon the behavior of hydrated peroxide, according to whether it is precipitated at a higher or lower temperature or according to the degree of washing that is applied to it. I am, of course, not at liberty to say anything about it now.

Dr. Pile.—The gravity of the sample I tried was only 1.022. The manufacturers claimed it to contain 5 per cent. As sold by some of the houses I found 1.029, and obtained from such four or five grains of dry residue, remaining at a temperature not high enough to decompose the oxychloride; so I think 1.029 would be the specific gravity of a reliable article.

Mr. Diehl.—Hager gives it at 1.046 both of his own preparation and the preparation originally made by Wagener.

Dr. Squibb.—I would like to ask the gentlemen if they have any experience in regard to the keeping of this dialyzed iron. In the experiments I made with the original solution, as sent to this country by Lebaigue, after the bottle was half empty the remainder showed a tendency to gelatinize; and that occurred first on the sides of the empty part of the bottle, and finally the whole liquid became perceptibly thicker; it did not lose its transparency, but became like a liquid jelly almost, and the gelatinization increases.

Dr. Pile.—I found that to be the case in one lot I made. I left it nearly a week and a half and found the whole dialyzer was covered with this thick jelly, as if coagulated.

Dr. Squibb.—Each teaspoonful is said to contain a centigram of iron; whether it was the oxide or oxychloride of iron I have never been able to understand.

Mr. Remington.—The suggestion has been made that the addition of 5 to 10 per cent. of alcohol to the solution would prevent the difficulty in the way of its keeping. I never had any difficulty. I have made considerable quantities and never knew it to gelatinize. It always remains liquid.

The Secretary.—Is it not, perhaps, the long-continued dialyzation that causes the trouble, the removal of too large a quantity of hydrochloric acid? That seems, from the experiments of Graham, to be most likely the case. A very basic oxychloride will remain in a solution for awhile, and then separate in the form of jelly, or somewhat like a clot of blood.

The Secretary read a paper on the Resin of Podophyllum (see page 420), written by Mr. Fred. B. Power; it was accepted and referred.

The Secretary.—I would like to make one or two remarks in regard to the paper I have just read, and I may state that, to some extent, somewhat similar results were obtained by one of the students of the Philadelphia College of Pharmacy. Noticing the acid character of the resin and the yellow coloration produced by alkalies, concentrated alcoholic solution was precipitated by water in which alum had been dissolved; a very bright-yellow colored resin of podophyllum was obtained, but the color was found to be entirely due to that compound of the acid resin with some alumina, and not to an admixture of berberina, as has been frequently supposed to be the case. In regard to the statement of Mr. Power that podophyllum does not contain an alkaloid, I am not fully prepared to agree with him. I have often observed that the liquid from which the resin had been precipitated would produce precipitates with iodo-hydrargyrate of potassium and various other general reagents for alkaloids; but I am also aware that this does not always occur. It is possible that upon the strength of such a reaction Mayer based his statement of the presence of berberina, which was made in 1863, but not by Mr. Hodgson, as assumed by the author of the paper.

Mr. Wellcome.—At one time Mr. Power thought he had isolated crystals, but in following up his experiments he did not succeed to isolate any crystalline compound.

The Secretary.—In my opinion, podophyllum occasionally does contain an alkaloid, and at other times it does not. At what season of the year it may contain it or not, requires to be settled.

A Member.—Does Mr. Maisch think the yellow color is due to alum?

The Secretary.—To the presence of a base. When the concentrated tincture of podophyllum is thrown into water in which alum has been dissolved, the precipitate is of a bright-yellow color, and contains a compound of alumina with the acid resin.

Mr. Shinn.—Does not the alum act as a mordant and fix the color?

The Secretary.—It is the observation of Mr. Power and others that all alkalies produce a deep-yellow color with the resin. Here is an insoluble bright-yellow alumina compound, and that remains mechanically mixed with the neutral resin and with any excess of acid resin, and hence the yellow color.

A Member.—I exhausted with alcohol and then precipitated with water and hydrochloric acid, and then got a bright-yellow color. I can't see where the alumina came from in that case. It was some years ago, so I am speaking from memory.

The Secretary.—I don't know but there are chances for the introduction of other matters. Perhaps the water contained lime in solution. I don't know whether the resin would be affected by an acid solution of a calcium salt, but as regards the alumina I can speak positively, because the experiments of Mr. Busch were made under my eyes.

Mr. Kennedy.—While in the laboratory of the Philadelphia College last winter, one of the students was working on the resin of podophyllum, and, if I remember correctly, it was almost colorless; at least, whitish.

The Secretary.—Correct.

Mr. Kennedy.—How was that prepared; by precipitation of alcoholic tincture with water?

The Secretary.—Merely by precipitation with water with or without the addition of muriatic acid. The addition makes no difference, provided the temperature is not raised too high. These results, to which Mr. Kennedy refers, are analogous to those obtained by Mr. Power. You may obtain a light or dark-colored resin by using cold or hot water. The water used in the experiments made at the Philadelphia College was distilled water. Hence the light color and impossibility to get a combination with any base, but as soon as that distilled water contained a little alum in solution, the bright-yellow precipitate was obtained.

Mr. Kennedy.—It was certainly the most remarkable resin of podophyllum, as to color, I ever saw.

At the request of Mr. B. J. McIntyre, Query 21, on Resin of Podophyllum, was continued for another year.

The Association then adjourned to half past 8 o'clock on Friday morning.

Sixth Session.—Friday Morning, September 7th.

Vice-President Ingalls took the chair at ten minutes before 9 o'clock and called the Association to order. The minutes of the fifth session were read and approved.

Mr. W. McIntyre, on behalf of the Committee on Queries, requested the continuance, for another year, of Queries 3, 4, and 13, all relating to the subject of fluid extracts. The request was granted.

Two papers, by Mr. J. U. Lloyd, on similar subjects, were presented by the committee; one, entitled "Glycerin in Fluid Extracts" (see page 408), was read by Mr. Kennedy. The other, entitled "Note on Official Fluid Extracts" (see page 409), by Mr. Eberle. Both were accepted and referred.

Query 8, relating to the proper menstruum for preparing the extract and fluid extract of arnica, and 31, relating to a process for obtaining a readily soluble extract of liquorice of definite composition, were called up, and at the request of the acceptor, Mr. M. L. M. Peixotto, dropped for the present.

The desirability of having a concentrated liquid preparation of lactucarium for the purpose of preparing readily the syrup and tincture occasionally called for, was the subject of Query 30. Mr. Jos. L. Lemberger, who had accepted the query, replied that in his opinion, such a preparation might be obtained, and that he would endeavor to present a satisfactory formula if the subject was continued to him for another year, and the Association should consider it of sufficient importance. It was voted that Mr. Lemberger be requested to furnish such a formula.

Mr. Wellcome read his answer to Query 53, "On the Bromine Production of the United States" (see page 448).

Query 47, on the amount of quinia contained in the commercial sugar-coated pills, being called for, the following communication was read:

NEW YORK, September 1st, 1877.

MR. WILLIAM MCINTYRE:

DEAR SIR: I regret to state that Query No. 47 will remain unanswered. I am sorry that this should be the case, as the question is one of great importance, but as it would not be complete without the list of manufacturers' names, I think that it should be undertaken by some analytical chemist, as very few pharmacists have sufficient time or apparatus at hand whereby an examination could be made, the result of which would not admit of a doubt.

In conclusion I would say that I have examined the pills of about six (6) of the most prominent makers, volumetrically, using Mayer's solution of iodohydrargyrate of potassium as a test reagent, and obtained results which a second analysis proved correct; but upon testing the effect of different excipients upon the precipitate of alkaloid, I found that some of them exerted a solvent action; for instance, the precipitate is quite soluble in glycerin, and as this is frequently used in pill-making, a manufacturer who used glycerin as an excipient in his pills, although a *smaller* amount of *quinine* might be present, would, with "Mayer's solution," indicate a *larger* percentage than those of another who did not use glycerin, and whose pills really contained more of the alkaloid. Again, the precipitate of iodohydrargyrate of quinia is soluble in water, and using the same amount each time to dissolve the pills, so that the error should be uniform, yet a difference in the net weight of alkaloid contained would give (with Mayer's solution) a varying result; these and many other such annoyances demanded more time than I had at my disposal, and on account of business cares I have been deterred from making any further experiments. I therefore earnestly ask that some one who has more time at his command will thoroughly ventilate this exceedingly interesting question.

DAVID HAYS.

The query was referred back to the committee, and at the request of Mr. Bedford, Query 18, on the use of preservative agents in syrup of ferrous iodide, was continued to him for another year.

A note, by Mr. L. M. Connor, on Adulterated Syrup of Iodide of Iron (see page 411), was read by Mr. Kennedy and referred.

THE SECRETARY.—To conclude merely from the discharge of the green color by the addition of nitric acid that anilin green was present, seems to be rather hasty. Nitric acid certainly has some action on syrup of iodide of iron; it liberates iodine, and the liberated iodine would hide any green color that might have been added.

MR. KENNEDY.—Nitric acid would certainly oxidize the iron and liberate iodine.

Mr. Shinn exhibited samples of paraffin-paper.

MR. SHINN.—Mr. Miller requested me to call the attention of the meeting to some specimens of paraffin-paper made by Mellor & Rittenhouse, of Philadelphia, and which is used in place of oil-silk and tin-foil. The note that he gave me states that this paraffin-paper served admirably for wrapping vanilla beans, soaps, sachet powders, linseed meal, putty, and other oily substances. It will prevent the access of air and moisture. The crinkling of the paper does not seem to break the surface and let the air in. It is also used for covering ointments, plasters, and solid extracts, and for wrapping chloride of lime, which is one of our most disagreeable things to handle and keep dry. These specimens, made with different grades of paper, were sent to be distributed among the members of the Association. It strikes me as being a

very valuable addition to our materials. I have been using, for some time, a paper made in England, somewhat similar to this, but I must say it does not meet the case as nicely as the samples shown, since it is very apt to crack in opening. This seems to be quite flexible, and I think druggists will find it of very great use for many purposes. It seems to be useful for many purposes for which oiled muslin and gum cloth are applied.

Mr. Wellcome.—What is the process of manufacture?

Mr. Shinn.—Mr. Miller did not tell me anything about the manufacture, but it is done in a very large way, and I think by a paper manufacturer who has all the facilities, it can be easily done by passing the sheets through melted paraffin and smoothing them to take off the excess; but being done at a large factory, I do not know what the process is. It is sold very cheaply, the price depending upon the kind of paper used, and being very little in excess over the price of ordinary paper.

Mr. Wellcome.—Many of the retail stores in New York make use of this paper, especially in wrapping camphor. Its value for this purpose depends a good deal upon the quality and texture of the paper. A very thin film of paraffin is put on the paper by placing a sheet of Russia iron (that which has a polish upon it is the best) over an alcohol stove, heating the iron, lubricating it with some paraffin, and placing the paper upon it. The paraffin is wrapped in a cloth and pressed down to keep it melted sufficiently to pass through the cloth and thus distributed over the paper. It is easily prepared by the apothecary, and with very little expense.

Mr. Shinn.—There are many apothecaries who have plenty of time to exercise themselves in this way. To those who have not, this will be an advantage, as it is cheap, and the paper is of all grades, from the heavy manila to light tissue-paper.

The Secretary.—It is a substitute for the wax-paper which has been used for many years in European pharmacy. There I believe it is almost universally prepared by the apothecaries themselves in a manner very similar to the process described by Mr. Wellcome.

Mr. Wellcome.—I think there is no or but very little wax-paper in our market; paraffin-paper is generally employed.

Mr. Gregory.—I find no difficulty in preparing wax-paper by putting the sheet over the stove with a thicker sheet under it, heating it and rubbing the wax on.

The Secretary.—By the use of a pad you can spread it very evenly.

Mr. Markoe read a paper on Resin of Scammony (see page 406), in answer to Query 59.

The Secretary.—I should like to ask whether the alcoholic extract of scammony is pulverizable?

Mr. Markoe.—There is scarcely any difference in the products.

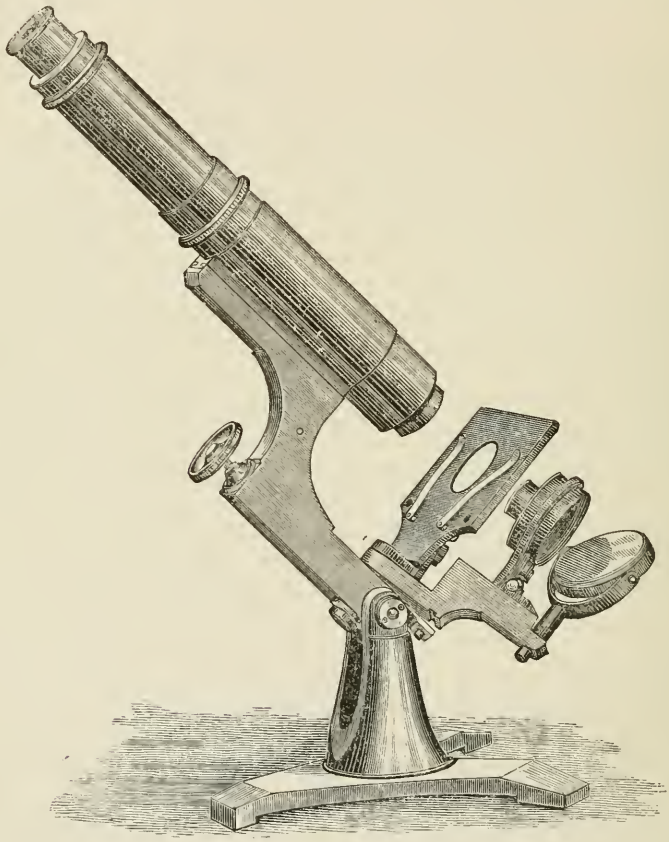
THE SECRETARY.—It is an important consideration.

MR. MARKOE.—The alcoholic extract seems to be rather the best product of the two, and to the casual observer there would be but little difference. I unfortunately forgot to bring the specimens of both products which I had ready for exhibition.

Query 36 being called up, Mr. Markoe exhibited one of Zentmayer's Histological Microscopes, and explained it as follows:

MR. MARKOE.—I would like to make a partial answer to Query 36, by calling the attention of the members to one of the recent forms of microscopes that has been put upon the market by Mr. Joseph Zentmayer, of Philadelphia. It is known as Zentmayer's American Histological Microscope. This excellent instrument combines many conveniences of the large first-class stands, superior optical qualities, and a very moderate cost. In my judgment it is better suited for pharmaceutical and histological work than any other instrument of the same cost now in the market. The entire instrument is made of brass, and as you see by the specimen here exhibited, is nicely finished and of graceful form. The base and upright supports are in one piece, and of such shape as to give great rigidity. The bell-metal bar that carries the body or tube of the instrument is connected by a joint, which allows the instrument at any angle of inclination; the perpendicular and horizontal positions are indicated by stops. The coarse adjustment or quick motion is by a sliding tube; the tube is five and one-half inches long, with a draw tube, by which it can be lengthened to the standard length of nine to ten inches, as usual in English and American stands. The short tube is very convenient when using the stand in an upright position, and is always wanted by medical students. A rack and pinion is furnished for coarse adjustment when wanted. The fine adjustment is quite novel, and is by far the best that has ever been devised, being alike in style with the one on Zentmayer's American Centennial Microscope, the most perfect stand that has been produced thus far. The fine adjustment is placed in the most stable part of the instrument, and consists of a lever concealed in the arm or bar of the instrument, and acted upon by a micrometer screw, and moves the whole body, which is fitted to the grooved bar, thus giving a very smooth, steady, and delicate movement entirely free from liability to produce lateral motion by prolonged use, a very common and very annoying fault in all instruments constructed on the Ross or the Hartnach plan. The sub-stage slides in the grooved bar that carries the plain and concave mirrors, and thus gives with this small stand the luxury of a movable sub-stage arranged in a way that was only furnished with the large first-class expensive microscopes. I wish to especially direct attention to the very ingenious and simple way in which the mirrors and the sub-stage are made to swing around a pivot, of which the axis passes through the object observed, the object being in every position in the focus of illumination. It will be seen then that by swinging the mirror over the stage, it can be used for illuminating opaque objects, and so doing away with a bull's-eye condenser. As a large share of botanical and pharmaceutical work has to

do with opaque objects, the usefulness and convenience of this arrangement will be quite apparent. The stage, as you see, is roomy, very firm and very thin in the centre, thus affording facility for extreme oblique illumination. It is only three inches above the table when in a horizontal position, so that



the hands can be supported by resting on the table. The stand is furnished with two eye-pieces, *A* low, and *B* high, eight-tenths inch and one-fifth inch objectives, the former 26°, the latter 75° angular aperture. The one-fifth inch easily resolves both sets of lines in the Pleurosigma angulatum. This outfit, with a black walnut case, is furnished for $55.

Mr. Bedford —What is the price of the stand alone?

Mr. Markoe.—The stand and eye-piece is $30. Then you can make your choice of objectives. If a person wants Hartnach, he can get an adapter at a moderate cost, and use English objectives.

Mr. Menninger.—What is the objection to the objectives that screw together?

Mr. Markoe.—They are generally very badly made, and not perfect objectives.

The Secretary.—Those on exhibition here by Dr. Hoffmann are very correct.

Mr. Markoe.—They may be in some cases, but if you put them through a critical test, you would find they would fail in comparison with those objectives of the higher grade. A good optician cannot make a stand and full set of objectives for $25 any more than a Fergusson watch can be made for $25.

The Secretary.—The mechanical advantages of this, in having a movable stage, a fine adjustment and swinging reflector are very great, but speaking of objectives alone, I think those on exhibition are very good for the moderate price.

Mr. Markoe.—They are very good for the class, but it is the lowest class. I make the remark in a general way. As a usual thing microscopists do not favorably regard these cheap divided objectives. They are better than nothing, and frequently you can find a good one, but take them all in all, you are apt to have them badly made.

Mr. Menninger.—There is nothing in theory against divided objectives if properly made.

Mr. Markoe.—Except it is very difficult indeed to get an objective that will answer for three different powers. There will be one place where it will work better than anywhere else. This microscope is a simplified form of what is now universally acknowledged to be the most perfect stand ever made, the Grand Centennial, that has every luxury that an expert would want.

Mr. Ebert.—What are the diameters of those objectives?

Mr. Markoe.—With these two eye-pieces and objectives, the range will be from fifty to nearly four hundred diameters. There is another point, speaking about these cheap objectives. They are a low angle, and it is easy to make a low angle objective for central work, but when you come to choose tests you need a wider angle; as the angle increases, the skill in manufacture increases, and when you say you can count on the fingers of your hands the number of opticians who can make objectives for difficult tests, you see why it is so expensive. You can use this little stand very satisfactorily for opaque work. You see by the angle of this objective the amount of light that will be let through. With the *A* objective it will let light enough through to examine seeds without the mirror or condenser. It is called, also, Zentmayer's Student Stand. I have furnished quite a number of these instruments to the medical department in Harvard, and the professors who have been pertinacious in preferring Hartnach's, say this is preferable to his.

Mr. Markoe exhibited also standard meter and liter measures,

and other appliances for illustrating the decimal system, all made by the American Metric Bureau, of Boston.

Mr. Markoe.—I have here a standard meter measure, which will give an idea of what a meter is. It is only about three inches and a half longer than a yard. In the metric system everything is derived from the unit of length, which is the meter. If we take a cubical vessel like this, having a square decimeter (which is the tenth of a meter) in the side, and fill it full of distilled water, we have the unit of measure, or the liter. If we take a little cube of the 100th part of a meter with water at its greatest density, we have the unit of weight, or the gram; and, of course, taking a thousand of these cubic centimeters will be equal to a cubic decimeter, and will weigh a kilogram, the exact weight of that vessel full of distilled water. So the student having a meter measure has the means to make correct standards for volume and weight. To demonstrate the relation a little more plainly, here is a cubic block having a square decimeter in the side and will exactly fit into this box. It has been so weighted as to just equal the weight of a thousand cubic centimeters of water, and placing it upon the scales you find that it weighs a kilogram, demonstrating that a kilogram of water, and a liter of water, and a thousand cubic centimetres are exactly the same. Then taking one of the small sections of this block, you have a cube of the 100th part of a meter, or one cubic centimeter, and it weighs one gram; so that block shows the exact volume of a cubic centimeter of water, which is the thousandth part of a liter, and can be called the milliliter, showing that the gram, the milliliter, and the cubic centimeter of water are the same thing. It is the starting-point of the unit of weight, and the term milliliter means that it is the thousandth part of a liter; and the cubic centimeter means that this little cube is one square centimeter in the side. Ten milliliters are equal to one centiliter, and ten of those are equal to a deciliter, ten of which, make again a liter. I thought I would bring these here as showing the efforts that have been made to simplify the metric system. Sets like these are being put in the public schools in Boston, through the institution known as the American Metric Bureau, which is composed of men who are interested in the introduction of the metric system. They have brought pressure enough upon manufacturers to induce them to manufacture the metric weights and measures of volume and capacity, and finish them very cheaply. Such a meter measure as this one is sold for about 60 cents, being cheaper than you can buy the corresponding English measure. Some are made with the English graduation upon one side and metric on the other. This dissecting metric block and liter case unfortunately cannot be finished very cheaply. It is the best of the kind, but has become patented, and the bureau cannot get hold of it to sell it as cheaply as they wish. It is furnished to schools for $5, and I think a set of this apparatus should have a place in every college of pharmacy. A full demonstrating set can be furnished for something like $10. I may say for the information of the members, that Fairbanks & Co. have been prevailed upon to furnish some very excellent commercial scales and weights at the same price they do the ordinary ones. They furnish a pile of iron weights

from the kilogram down to the gram, for the same price that the corresponding pile of common weights are furnished. I may also say you can buy from them platform scales with double beams, one being pounds and the other kilograms, for the same price as the ordinary scales. They have also made cheaper forms of brass weights, that they sell at about the same price that they do the ordinary block avoirdupois weights, so there is no excuse for the pharmacist not getting a set of metric weights and measures. If members will take advantage of the fruits of the Metric Bureau, they can get many of the things at the lowest wholesale price.

Mr. Remington.—Have you brought with you the metric charts?

Mr. Markoe.—They have been got up by the Metric Bureau, and are sold for half of what they cost. I shall be glad to furnish them through the bureau to any institution at much less than they can be got for anywhere else. The funds of the bureau are used for their introduction, and it will continue to be done as long as the funds hold out. The American Metric Bureau and the American Metrological Society have agreed upon a system of spelling, dropping the French method. For the unit of measure they adopt *liter* instead of *litre*, *gram* instead of *gramme*. That leaves no doubt as to the proper way of pronouncing, whereas people were apt to speak of a gramme as a gram-me, for instance. There is also some confusion between *deci* and *deca*, and we voted to use *k* for the latter, thus, *deka*, which again leaves no doubt as to the pronunciation. If members in writing papers or using the metric system will bear this in mind, it will serve to extend the English method of pronunciation.

Mr. Saunders read a volunteer paper on Commercial Cream of Tartar (see page 458), which was accepted and referred.

Mr. Sheppard.—A large manufacturer of cream of tartar gave to me, during the past year, his formula for making cream of tartar for the grocers, which is 6 lbs. of tartaric acid and 94 lbs. of terra alba.

The chair appointed the following Committee on the Pharmacopœia: Charles Rice, Frederick Hoffmann, and P. W. Bedford, of New York; John M. Maisch, Joseph P. Remington, and Charles Bullock, of Philadelphia; G. F. H. Markoe and S. A. D. Sheppard, of Boston; John F. Hancock, Baltimore; A. E. Ebert, Chicago; C. Lewis Diehl, Louisville; E. S. Wayne, Cincinnati; W. H. Crawford, St. Louis; Charles Mohr, Mobile, Ala.; Emlen Painter, San Francisco, Cal.

On motion of Mr. Hoffmann, the name of the President was added to the committee, and on motion of Mr. Sheppard, the chairman was authorized to draw upon the Treasurer of the Association for the necessary expenses of the committee to an amount not exceeding fifty dollars.

The report of the Committee on Exhibition was read by the Secretary, slightly modified, and then accepted and referred (see page 377).

Mr. Wellcome.—I move that in future the Association do away with the custom of having exhibitions. They may be very good for the advertising of manufacturing houses, but I doubt their value to the Association; on the contrary, I think that they are rather a great detriment to the Association. The house I am connected with have exhibited at the meetings of the Association, and I know it has been profitable to them. In case you continue the exhibitions, they will probably continue to exhibit and receive profit from it. But I believe that the exhibitions bring the recognition of the Association to preparations which would not be admitted into the meetings, a class of pharmaceutical preparations which it seems to be the sentiment of the Association to suppress. While they may be of some interest to a few, I think, on the whole, they are seriously objectionable. The annual reports often contain very complimentary comments on the displays, and this serves as an advertisement of the exhibitors. I think exhibitions should be kept entirely separated from the Association. If houses have enterprise enough to make exhibitions, let them do it on their own responsibility, but without being in any way indorsed by the Association. There have been many remarks made by druggists upon this subject, particularly as regards these indorsements by the Association, which were not complimentary.

The President.—A motion of this kind would have to stand over until next year, as it would involve a change in the By-laws. The By-laws provide that the second session shall close with the examination of the specimens on exhibition.

Mr. Wellcome.—Would not my motion be in order to discontinue exhibitions of this sort, and then to make the amendment afterwards? I did not know that the laws provided that we shall have an exhibition, but supposed it to be a matter of custom.

The President read of Chapter VIII of the By-laws, Article II, Section 9, and Article III, Section 8, and decided that Mr. Wellcome's motion to discontinue the exhibition in connection with the annual meeting was an alteration of the By-laws, and could not be acted on at this session.

Mr. Wellcome.—Those clauses refer to the appointment of a committee and also to an adjournment. The motion I make is that in future the Association do away with the exhibition.

The Secretary.—It seems to me the ruling of the Chair is perfectly correct, that this motion would necessitate alterations of the By-laws, and with Mr. Wellcome's consent, I would move that his motion be referred to the Executive Committee for report at the next annual meeting. That would

not do away with the exhibition next year, but might perhaps result in the discontinuance of the exhibition in the future, although I must confess personally I am opposed to it. I recognize the desirability, and perhaps necessity, of drawing some strict lines, but I should be very sorry to have the exhibition discontinued altogether.

MR. SHEPPARD.—I did not hear Mr. Wellcome's motion seconded.

MR. WELLCOME.—I hope this matter will be brought up now and discussed, because it is an important one. I know there have been many uncomplimentary remarks in regard to the Association upon this point. I think the Association has been made too much a medium for advertising, and that many things have been brought here on exhibition that could not be brought into the room and presented before the meeting. At this occasion the members of Toronto have certainly done everything possible to make it of interest to the members, and I think the thanks of the Association are due to them, but that it has been of any great interest to the members of the Association I doubt, while certainly the report is very complimentary to all the houses that exhibit. I would like to hear an expression of the views of other members.

MR. REMINGTON.—I hope Mr. Wellcome's motion will not prevail. The exhibitions which have been held have certainly been very useful and very instructive to a great many of the members, and while I will admit that they are a great deal of trouble to some of the gentlemen who get them up, still if they are repaid in any degree by the advertising they get, I consider it is perfectly legitimate. If we throw overboard the exhibitions entirely, and allow exhibitions to be made upon which no report will come to the Association, we will then have a great mixture of patent medicines and of a great many things over which now we exercise some control in the present management.

MR. WELLCOME.—I believe the exhibitions as a general thing have been a matter of advertising for the houses. That has been their object and effect, and produced a manner of drumming up trade, which I believe can be done in a more legitimate manner. I scorn everything that comes under the head of professional advertising.

The resolution offered by the Secretary, to refer Mr. Wellcome's motion to the Executive Committee for consideration and report at the next annual meeting, was adopted.

The following papers in answer to queries were read: No. 27, on Ergotin, by Mr. G. Zellhoefer (see page 404), by the Secretary, and No. 41, on the Necessary Knowledge of Therapeutics by Pharmacists, written by Mr. B. T. Fairchild (see page 396), by Mr. Menninger.

The Secretary read a letter from Mr. John Davy, Secretary of the Toronto Mechanics' Institute, placing the facilities of the reading-room of that institution at the disposal of the members during their stay in the city. The invitation was accepted with thanks.

The Business Committee offered the following resolutions, which were unanimously adopted:

Resolved, That the thanks of this Association be and are hereby tendered to the Hon. Adam Crookes, Minister of Education, and to the Department of Education of the Province of Ontario, to the officers and members of the Ontario College of Pharmacy and their ladies, and to the citizens of Toronto, for the uniform kindness and hospitable attention to the members of this Association during their stay at Toronto.

Resolved, That the thanks of the Association are tendered to the city government of Toronto for the use of the City Council chamber and other attentions during our sessions.

Mr. Ebert moved a vote of hearty thanks to the daily press of Toronto for the full and accurate reports of our transactions. It was likewise carried unanimously.

Mr. Wm. McIntyre, Chairman of the Committee on Papers and Queries, stated that twenty-six of last year's queries had not been responded to, and moved that they be referred to the new committee, with the privilege of granting the requests of the various members for their continuance or dropping. The motion was agreed to.

The Chairman of the Executive Committee, being ready to report further applications for membership, stated that he held an application from a gentleman, who was formerly from New York, but now resided in Paris, France.

The Secretary opposed his admission on the ground that it would be establishing a precedent for electing active members from any part of the world.

Several members pointed to the fact that the Association already had members residing outside of the limits of the United States, and in reply it was stated that notwithstanding the clause in the Constitution, it had always been practically ruled that members were eligible from any part of America; moreover, several now residing in other parts of America, at the time of their election, had been residents of the United States. And Mr. Sheppard contended that the removal of a member to a foreign country could not be cause for his dismissal.

Messrs. Bedford and Peixotto stated that the gentleman alluded to was a citizen of the United States and resided merely temporarily in France; and it was agreed that he was eligible under our Constitution and By-laws.

Mr. Remington called attention to Article I of the Constitution,

and to the different practice followed by the Association for many years, and offered the following preamble and resolution, which, involving an alteration of the Constitution, were laid over until the next meeting.

WHEREAS, Article I of our Constitution declares that "this Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable pharmaceutists and druggists of *the United States* in the following objects," and as we have already admitted many valued members, not from the limits of the United States but residing in America, it is hereby

Resolved, That Article I of the Constitution be amended by striking out the words "the United States" and inserting in place thereof "America."

The Executive Committee reported the following applications for membership:

Florida.

James L. Howarth, Jacksonville.

Georgia.

Jesse W. Rankin, Atlanta.

Indiana.

Hubert J. Marshall, Aurora.

Louisiana.

Doric B. Flemmich, New Orleans.

Missouri.

H. E. Ahlbrandt, St. Louis.

New York.

Louis S. Cohen, New York.
Adolph Levy, Brooklyn.
Wm. G. Mortimer, New York.

Ontario.

E. Harvey, Toronto.
John C. Lander, Toronto.
George Massey, "
B. A. Mitchell, London.
E. B. Shuttleworth, Toronto.

Mr. Peixotto was appointed teller, and reported the unanimous election of the candidates.

The Committee on Queries read a list of new subjects which had been accepted for reply at the next meeting. Mr. Diehl objected to one of the queries submitted, referring to vaseline and cosmoline, neither of which he considered to be a proper subject for the further consideration of this Association. The objection was sustained, and the question stricken from the list, which now remained as follows:

QUERY 1. In view of the remedial properties accorded to Coca leaf—Erythroxylon Coca—what pharmaceutical preparation can be made, having its properties in the most desirable form?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

2. What is the therapeutic value of dialyzed Iron as an antidote for Arsenious Acid as compared with the hydrated Ferric Oxide?

Accepted by Adolph Tsheppe, New York.

3. Would the substitution of Citrate of Sodium for Citrate of Ammonium in the officinal Pyrophosphate of Iron make the latter less liable to become insoluble on keeping?

Accepted by G. F. H. Markoe, Boston, Mass.

4. What is the comparative therapeutic value of Ergot grown in the United States and Europe?

Referred to George Zellhoefer, New York.

5. The affinity of Glycerin for water is well known; to what extent will officinal Glycerin attract moisture on being exposed to a damp atmosphere?

Accepted by Geo. W. Kennedy, Pottsville, Pa.

6. Ergot contains a large quantity of fixed oil which sometimes interferes with percolation, and which the British Pharmacopœia removes by ether. May Petroleum Benzin be used for the same purpose and without injuring the medicinal properties of Ergot? What quality of Benzin (spec. grav., boiling-point, etc.) is best adapted for the purpose, and may the fixed Oil be used either in medicine or the arts?

Accepted by P. W. Bedford, New York.

7. Damiana. An essay in regard to its medicinal value and active constituents, including its history and botanical source.

Accepted by H. J. Menninger, Brooklyn, N. Y.

8. Are there any drugs now successfully cultivated here which were formerly obtained from foreign countries?

Accepted by H. S. Wellcome, New York.

9. Compound Resin Cerate alters in consistence upon keeping. How can this be prevented?

Accepted by S. A. D. Sheppard, Boston, Mass.

10. Confectioners frequently use deleterious substances for coloring candies. How can harmless colors, suitable for their use, be made?

Referred to S. P. Sharples, Boston, Mass.

11. Tinctures. Experiments and suggestions in regard to proportion of drug and strength of alcohol necessary for extraction and preservation.

Referred to Jacob Jesson, Chippewa Falls, Wis.

12. On the condition of the mercurial constituent in the several pulverulent preparations as recommended to be prepared with Sugar of Milk. (See Amer. Jour. Phar., 1876, p. 267.)

Accepted by P. W. Bedford, New York.

13. To what extent do the pills of the United States Pharmacopœia supply the demand for ready-made pills? Are there any formulas which, if introduced, would add to the value of the list?

Accepted by R. V. Mattison, Philadelphia, Pa.

14. How do the commercial Bismuth preparations compare with the requirements of the United States Pharmacopœia?

Accepted by Adolph Tsheppe, New York.

15. It is written of the berries of Benzoin odoriferum (Spice Bush Berry), that they yield nearly fifty (50) per cent. of fixed oil, besides about five (5) per cent. of agreeable volatile oil. Is this really so? The plant being very common in some parts of the United States, for what can its products be utilized?

Accepted by A. W. Miller, Philadelphia, Pa.

16. There is a counterirritant or revulsive plaster spread upon linen or cotton cloth purporting to be made in Paris, France, under the name of "Emplastrum Thapsiæ." As this has decided therapeutic value, what is its composition, and can it be advantageously prepared and kept for extemporaneous use?

Accepted by H. P. Tarrant, Augusta, Ga.

17. What advantage, if any, would result from the removal of fixed oil from Colchicum seed preparatory to the preparation of the fluid extract.

Accepted by E. L. Boerner, Iowa City, Ia.

18. Extractum Glycyrrhizæ fluidum. Should the alcoholic strength of the preparation be reduced, or what other changes are desirable in the formula to increase its adaptability for masking the taste of unpleasant medicines under varied circumstances?

Accepted by J. P. Remington, Philadelphia, Pa.

19. Can any improvement be suggested in the formula of the Pharmacopœia for fluid extract of Wild Cherry—keeping its object in view to represent chiefly the astringent and tonic virtues combined with as much hydrocyanic acid and volatile oil as may be obtained by percolation?

Accepted by J. T. Shinn and Israel J. Grahame, Philadelphia, Pa.

20. What is Oil of Cedar of commerce? Where and from what plant or plants is it made, and what is it used for?

Accepted by J. H. Stein, Reading, Pa.

21. Solvents for Wax, Paraffin, Stearin, Ceresin, as a test for adulteration of wax.

Accepted by P. W. Bedford, New York.

22. Galbanum is extensively adulterated. What are the adulterations?

Accepted by A. E. Ebert, Chicago, Ill.

23. Can Salicin be economically made in North America, and by what process?

Accepted by E. Gregory, Lindsay, Ont.

24. Can Grape-sugar or Glucose be substituted for Cane-sugar, Honey, and Glycerin, in pharmaceutical preparations? Give a practical essay on the subject.

Accepted by E. H. Sargent, Chicago, Ill.

25. An essay on the conditions necessary to successfully conduct percolation.

Accepted by J. U. Lloyd, Cincinnati, O.

26. How can the Salts of Berberina be most easily prepared from the root of Hydrastis Canadensis? What will be the practical yield, and what are the solubilities of the different salts?

Accepted by J. U. Lloyd, Cincinnati, O.

27. Resin of Podophyllum is found upon the market in color ranging from light-brown to deep-yellow. Can these various shades be obtained from Mayapple root without the use of foreign substances?

Accepted by J. U. Lloyd, Cincinnati, O.

28. How do Rio and East India Tapioca compare in dietetic value?

Accepted by William J. Jenks, Philadelphia, Pa.

29. Give a formula for a concentrated liquid preparation of Lactucarium, from which can be made the Syrup, Tincture, or other preparations.

Accepted by Joseph L. Lemberger, Lebanon, Pa.

30. Report on the brands of White Wax in the market.

Accepted by P. W. Bedford, New York.

The Executive Committee presented the following communication:

The undersigned respectfully submit the following proposals for honorary membership in the American Pharmaceutical Association:

Prof. H. A. L. Wiggers, Göttingen, Germany.
Prof. G. Planchon, Paris, France.
Prof. Ed. Schaer, Zurich, Switzerland.
Prof. X. Landerer, Athens, Greece.

(Signed), Albert E. Ebert, John M. Maisch, E. P. Nichols, C. Lewis Diehl, H. J. Menninger, Charles Rice, Israel J. Grahame, James T. Shinn, Saml. A. D. Sheppard, Geo. W. Kennedy.

On motion of the Business Committee, the President was directed to cast an affirmative ballot for the nominees, and Mr. Peixotto acting as teller, they were declared elected.

Mr. Sheppard, in behalf of the Nominating Committee, proposed Mr. J. W. Rankin, of Atlanta, Ga., for Local Secretary for the ensuing year, and the nominee was duly elected.

The Business Committee offered the following resolution, which was unanimously adopted:

Resolved, That the thanks of the Association be tendered to the Local Secretary at Toronto, Mr. H. J. Rose, for the efficient manner in which he has discharged his arduous duties.

The minutes of the last session were read by the Secretary and approved.

Mr. Rose.—Mr. Chairman and Gentlemen: I feel gratified that my efforts to do my duty have been so cordially received and appreciated by the members of this Association. There are gentlemen connected with the reception of the Association in Toronto that I think deserve even warmer thanks than those tendered to me, and they are gentlemen who have never experienced, as I have, the cordial greeting extended to all the members everywhere, at all the meetings. In working as they have done to second my efforts to give you a welcome, they have not had the stimulus which I have had to make the reception a success. As a member of the Association, if in order, I should like to move a vote of thanks to these gentlemen.

The President.—That has already been done, and as I see Mr. Love, the Chairman of the Committee on Entertainment present, I should like to have him say a word on these resolutions (the President here read the resolution thanking the Toronto members for their courtesy, see page 572). That has received the most unanimous and hearty response from the members of the Association, and I wish to convey through Mr. Love this resolution to the citizens of Toronto, the pharmacists of Toronto, and the members of the Ontario College of Pharmacy.

Mr. Love.—I will merely say that it is very gratifying to me to have been an instrument in making your reception in Toronto comfortable and happy. We rejoice to see you, and hope you have felt at home among us. The little we have done is amply repaid by the fact that you have enjoyed yourselves.

Mr. Hodgetts.—As a Canadian and member of this institution, I would be very happy to propose a toast before we part, one in which I am sure we can all join. There are many faces here who have met our Toronto friends for the first time, probably the last. Many of us I hope will meet again. The toast I give you is, "Happy to meet; sorry to part; happy to meet again."

Mr. Menninger.—Although we have nothing to go through a toast formally, I hope the gentleman will pardon me if I offer one. As a citizen of a republic, and an ex-officer of a republic, I am especially proud to meet upon the soil of a monarchy, and be able to there express the respect of our people for the lady monarch of this realm. I propose the health of Her Most Gracious Majesty Queen Victoria.

Mr. Shinn.—As one of the visiting members of this Association, I feel that we have scarcely been demonstrative enough to the citizens of Canada

for their very warm reception, and I am very glad this little expression has taken place. You, perhaps, remember that about one hundred years ago our forefathers had a slight difference, we may say, with the mother country, that country which is now presided over by Her Most Gracious Majesty, who reigns so supremely in the hearts of all her subjects. Our forefathers came over the line with their generals and colonels, perhaps a private or two, and they were repulsed. We have now invaded you with our wives and daughters, and perhaps, mothers-in-law, thrown in by way of heavy artillery, but are not repulsed. To be sure we are met by arms, but they are the open arms of friendship, and the right hand of fellowship is extended to us. We are not repulsed, but we are captured. Our hearts are captured by this kindness of the citizens of Toronto. Gentlemen of the United States, I move you express your appreciation of this kindness by three cheers for the citizens of Toronto.

The toasts were heartily responded to, and the cheers were given with enthusiasm.

Mr. Waugh.—As an old member of the Association and a Canadian, it is very gratifying to me to find that our American brethren have enjoyed themselves in this city—the Queen City of the West. I can only say, as one of the members of our Ontario College of Pharmacy, that it has been very gratifying to me, and that I am positively certain that we Canadians have enjoyed your visit and your presence. We are probably a little slower than the Americans in this respect, but we have tried to make everything as pleasant as we possibly could. In regard to the remarks of Mr. Shinn, I will add that as you have brought not only your wives but your daughters, we don't know what little coalescing may happen. It is a well-known fact, that as a community we are pretty well mixed. On behalf of the College of Pharmacy I wish to say that we sincerely hope, although you meet so far South, at the next meeting, that you will not forget Canada, which is not the backwoods that some of our members have really expected to see.

On motion of the Business Committee, the Association now adjourned, to meet again at Atlanta, Georgia, on the first Tuesday, the third day of September, 1878, at 3 o'clock, P.M.

The following delegates to the twenty-fifth annual meeting became members by signing the Constitution, in conformity with Chapter VI, Article VI, of the By-laws.

William Elliot, Toronto, Canada.
George Hodgetts, Toronto, Canada.
Alexander A. Menard, Macon, Ga.
E. A. Sayre, Brooklyn, N. Y.
Louis Shaw, Philadelphia, Pa.
Romanta Wells, New Haven, Conn.

John M. Maisch,
Permanent Secretary.

THE excursions to and from Toronto, on the occasion of the twenty-fifth annual meeting, have been so pleasant that they will be long remembered by those who participated in them. The routes led through a section of the continent which, in point of natural beauties and picturesque scenes, has few rivals.

Wednesday, August 29th, a party left Philadelphia by way of Harrisburg and Williamsport, being joined by others on the route, which led up along the Susquehanna, and over the northern branches of the Alleghenies, into that beautiful valley into which Havana and Watkins' Glens open, and where Seneca Lake spreads its silvery sheet of water. After a day's travel the comfortable quarters of the Glen Mountain House, located on the cliff near one of the numerous cascades of Watkins' Glen, were reached. The fine weather favored the evening and early morning promenades to the neighboring points, from which delightful views are obtained, and the exploration of the winding gorges and circular basins of Watkins' Glen, and the abrupt and angular turns of Havana Glen. Earlier than originally contemplated, the party left this pleasant retreat, on Friday noon, to make room for other guests, and, after a charming sail on Lake Seneca to Geneva, took the railroad to Rochester, where their fellow-member, Mr. G. H. Haas, showed them the most friendly attentions, and enabled them to see as much as possible of that thriving and beautiful city.

Niagara Falls and the headquarters at the Cataract House were reached on Saturday afternoon, and during the following night the party was joined by others from various sections, among them a large party who had left New York on Thursday and Friday, and travelling up the Delaware valley and down the upper course of the north branch of the Susquehanna, had stopped at Watkins. The early risers at Niagara were rewarded with the sight of a clear sky, and a beautiful, ever-changing rainbow, rising high up above the mist of the mighty Fall. Later in the forenoon, Prospect Point was a favorite station of observation to view the rainbows, which fluttered in the gorge of Niagara River through the spray below the Falls, and throughout Sunday and Monday numerous expeditions were undertaken to the various points of interest in the neighborhood.

The members who had business to attend to at Toronto on Tuesday before the opening of the sessions left Niagara Falls on Monday, reaching Toronto by steamer after a sail across Lake Ontario, which to some was rendered less delightful than it would otherwise have been by seasickness, the effects of which were soon forgotten in the hospitable halls of the Rossin House, where the headquarters had been established, and where, on Tuesday, they were followed by the majority of the visiting members, with their ladies.

The pharmacists and druggists of Ontario had very thoroughly planned a series of entertainments, which were as liberal on their part as they were pleasing to the recipients thereof. On Tuesday forenoon, they invited the visitors who had arrived, and most of whom were, by their duties, subsequently deprived of the opportunity of seeing the city, to a drive to the most important public institutions, which were afterwards also inspected by the other visitors. On Wednesday evening, September 5th, a very pleasant entertainment was tendered to the Association, by their Ontario friends, in the

Normal School buildings, where they had an opportunity of examining the liberal collections of scientific instruments, works of art, and other means of instruction, and, aside from the refreshments, were treated to an excellent vocal and instrumental concert, highly enjoyed by all. The buildings and grounds had been kindly opened for the purpose by the Department of Education of the Province of Ontario.

The visiting ladies were carefully looked after by the Canadian ladies and by the Local Committee on Arrangements, and enjoyed some charming drives through the city and in the suburbs.

After the adjournment of the Association, most of the visitors left Toronto on Friday afternoon, for the St. Lawrence River and Montreal, but a goodly number availed themselves of the opportunity afforded them by their Canadian brethren to visit one of the most picturesque sections of their country, the primeval beauty of which has scarcely been interfered with by the axe of the settler. Travelling by rail northward, after passing Holland Swamp, Lakes Simcoe, Couchiching, and several smaller lakes, the party left the cars at Gravenhurst and embarked on the steamer Nipissing, which carried them over Lake Muskoka, and through Indian River, by means of a lock, into the higher lake, Rousseau, at the northern end of which they obtained very fair accommodations at the Rousseau House. Both lakes, but more particularly the former, are bestudded with hundreds of rocky and densely wooded islands, nearly all of which are uninhabited ; it occurs rarely that the smoke from a chimney or a camp-fire is observed, or that the stillness is broken by busy scenes on the shore. But the view changes continually, and the dark-colored but transparent waters reflect like a perfect mirror all surrounding objects, and at night the stars, which glisten and twinkle with great beauty through the clear atmosphere. Muskoka and Shadow Rivers were particularly admired for the perfect reflection of the multitudinous forms and colors of the shrubs and trees, which, decked with their autumn foliage, lined the shores.

After some days of rest in this highland and lake region, the party returned to Toronto, and followed those who had preceded them, by steamer down Lake Ontario and the St. Lawrence River, past the Thousand Islands, and through the several rapids to Montreal, and some further on to Quebec, where they were handsomely entertained by some of the pharmacists. Leaving Montreal, Lakes Champlain and George, with their elegant surroundings, were reached. Saratoga and Albany were visited, and on the trip down the Hudson and past the Catskill Mountains the romantic scenery of the Highlands was admired, and the excursionists returned to their homes, hoping for a similar reunion on the occasion of the next annual meeting.

During the entire trip nothing had occurred to mar the pleasure, except the serious illness of Dr. W. H. Pile, which kept him confined to his bed at the Rossin House, Toronto, until he had so far recovered from an attack of paralysis as to be able to bear the fatigue of the journey to his home in Philadelphia, where, we are pleased to state, he is gradually improving. Another member, who with his family heartily enjoyed the excursion, Ashel Boyden, of Boston, we are sorry to learn, has unexpectedly departed this life.

JOHN M. MAISCH,
Permanent Secretary.

LIST OF PUBLICATIONS RECEIVED

For the American Pharmaceutical Association.

Societies and editors are respectfully requested to forward all publications intended for the American Pharmaceutical Association to the Permanent Secretary. European exchanges, if not sent by mail, will reach us through the Smithsonian Institution at Washington.

JOHN M. MAISCH,
145 North Tenth Street, Philadelphia, Pa.

The Druggists' Circular, New York, 1877.
New Remedies, New York, 1877.
Oil, Paint, and Drug Reporter, New York, 1877.
American Journal of Medical Sciences, Philadelphia, 1877.
Medical News and Library, Philadelphia, 1877.
Detroit Medical Journal, 1877.
The Pharmacist, Chicago, 1877.
Pacific Medical and Surgical Journal, San Francisco, 1877
The Canadian Pharmaceutical Journal. Edited by E. B. Shuttleworth, 1877.
Pharmaceutical Journal and Transactions, London, October, 1876, to September, 1877.
The Calendar of the Pharmaceutical Society of Great Britain, 1877.
Yearbook of Pharmacy and Transactions of the British Pharmaceutical Conference, 1876.
The Chemist and Druggist, London, 1877.
The Chemists' and Druggists' Diary, 1878.
Bulletin de la Société Royale de Pharmacie de Bruxelles, 1877.
Pharmaceutische Zeitschrift für Russland, 1876, complete; 1877, Nos. 1–5, 9–13.
Sitzungsberichte der K. Bayer. Akademie der Wissenschaften, 1875, 3; 1876, 1. 2.
Nachrichten von der K. Gesellschaft der Wissenschaften, etc. Göttingen, 1876.
Pharmaceutische Centralhalle, Berlin, 1877.
Archiv der Pharmacie, Halle, 1877.
Zeitschrift des allgemeinen oesterreichischen Apotheker-Vereines. Wien, 1877.
Anzeiger der K. K. Akademie der Wissenschaften. Wien, 1877.
Schweizerische Wochenschrift für Pharmacie, 1877.
Proceedings of the American Academy of Arts and Sciences, Boston, xii.
Transactions of the College of Physicians of Philadelphia, third series, vol. iii, 1877.
Transactions of the Illinois State Medical Society, 1876. Twenty-sixth annual session. N. S. Davis, M.D., Secretary, Chicago.

Transactions of the South Carolina Medical Association, 1877. H. D. Fraser, M D., Secretary, Charleston.

Transactions of the Minnesota State Medical Society, 1877.

Annual Report of the Mercantile Library Company of Philadelphia, January, 1877.

Annual Report of the Trustees of the Astor Library Company of the City of New York, January, 1877.

Catalogue of Officers and Students of Trinity College, 1877.

Transfusion und Plethora, von Jacob Worm Müller. Christiania, 1875.

LIST OF SOCIETIES, LIBRARIES, JOURNALS, AND INDIVIDUALS,

To whom complimentary copies of the Proceedings of this Association are forwarded.

The State Libraries of all the States of the Union except Connecticut.		
Maine Pharmaceutical Association,	Portland,	Maine.
Bowdoin College,	Brunswick,	"
Dartmouth College,	Hanover,	New Hampshire.
New Hampshire Medical Society, Dr. G. P. Conu, Secretary,	Concord,	"
Amherst College,	Amherst,	Massachusetts.
Harvard University,	Cambridge,	"
Massachusetts College of Pharmacy,	Boston,	"
American Academy of Arts and Sciences,	"	"
City Library,	"	"
City Hospital,	"	"
Massachusetts General Hospital,	"	"
Boston Athenæum,	"	"
Vermont Pharmaceutical Association, A. W. Higgins, President,	Rutland,	Vermont.
University of Vermont,	Burlington,	"
Brown University,	Providence,	Rhode Island.
Trinity College,	Hartford,	Connecticut.
Silas Bronson Library,	Waterbury,	"
Yale College,	New Haven,	"
College of Pharmacy of the City of New York,	New York,	New York.
Literary and Scientific Society of German Apothecaries,	"	"
Druggists' Circular,	"	"
New Remedies,	"	"
Oil, Paint, and Drug Reporter,	"	"
Astor Library,	"	"
Mercantile Library,	"	"
Long Island Historical Society,	Brooklyn,	"
Camden County Pharmaceutical Association,	Camden,	New Jersey.
Philadelphia College of Pharmacy,	Philadelphia,	Pennsylvania.
College of Physicians,	"	"
Pennsylvania Hospital,	"	"

Academy of Natural Sciences,	Philadelphia,	Pennsylvania.
American Philosophical Society,	"	"
Philadelphia Library,	"	"
Mercantile Library,	"	"
American Journal of Medical Sciences,	"	"
Medical Society of the State of Pennsylvania,	"	"
Maryland College of Pharmacy,	Baltimore,	Maryland.
University of Maryland,	"	"
Maryland Academy of Sciences,	"	"
Smithsonian Institution,	Washington,	Dist. Columbia.
Congressional Library,	"	"
Surgeon-General, United States Army,	"	"
Department of Agriculture,	"	"
National College of Pharmacy,	"	"
Library of the American Medical Association,	"	"
Richmond Pharmaceutical Association,	Richmond,	Virginia.
Medical Society of Virginia, L. B. Edwards, M.D., Secretary,	"	"
South Carolina Medical Association, Dr. H. D Fraser, Secretary,	Charleston,	South Carolina.
Tennessee College of Pharmacy,	Nashville,	Tennessee.
Louisville College of Pharmacy,	Louisville,	Kentucky.
Cincinnati College of Pharmacy,	Cincinnati,	Ohio.
Cincinnati Academy of Medicine,	"	"
Longview Asylum,	Carthage,	Hamilton Co., O.
Detroit Medical Journal,	Detroit,	Michigan.
University of Michigan,	Ann Arbor,	"
Chicago College of Pharmacy,	Chicago,	Illinois.
Illinois State Medical Society,	"	"
St. Louis College of Pharmacy,	St. Louis,	Missouri.
St. Louis Academy of Science,	"	"
St. Louis Mercantile Library,	"	"
St. Louis Public School Library,	"	"
Kansas State University,	Lawrence,	Kansas.
Minnesota State Medical Society, C. H. Boardman, M.D , Secretary,	St. Paul,	Minnesota.
California Pharmaceutical Society,	San Francisco,	California.
Pacific Medical and Surgical Journal,	"	"
Montreal College of Pharmacy,	Montreal,	Canada.
Ontario College of Pharmacy,	Toronto,	"

Escuela de Farmacia, Mexico.
Sociedad Medico-farmaceutico, Merida, Yucatan.
Sociedad de Farmacia Argentina, Buenos Aires.
British Pharmaceutical Conference, Dr. J. Attfield, London.
Pharmaceutical Society of Great Britain, London.
Pharmaceutical Journal and Transactions, London.

Chemical News, London.
Chemist and Druggist, London.
Journal of Applied Science, London.
British Museum, London.
Philosophical Society, Glasgow.
Liverpool Chemists' Association.
Association of Chemists and Druggists, Wolverhampton.
Pharmaceutical Society at Edinburgh.
Netherland Pharmaceutical Society, A. J. Rijk, President, Amsterdam.
Académie Royale de Médecine, Bruxelles.
Société de Pharmacie Royale de Bruxelles.
Société Royale des Sciences Médicales Naturelles, Bruxelles.
Société de Pharmacie d'Anvers.
Société de Pharmacie, Paris.
Académie des Sciences, Paris.
Répertoire de Pharmacie, Paris.
Schweizerische Wochenschrift für Pharmacie, C. W. Stein, St. Gallen.
Zeitschrift d. Allg. Oesterreichischen Apotheker Vereins, Wien.
K. K. Gesellschaft der Aerzte, Wien.
K. Akademie der Wissenschaften, Wien.
K. Bayer. " " München.
University of Strassburg.
Deutscher Apotheker-Verein.
Archiv der Pharmacie, Waisenhausbuchhandlung, Halle.
Prof. Dr. Wöhler, Göttingen.
K. Akademie der Wissenschaften, Göttingen.
Verein der Apotheker, Berlin.
Pharmaceutische Centralhalle, Dr. H. Hager, Pulvermühle bei Fürstenberg.
Pharmaceutische Zeitung, Bunzlau.
Pharmaceutische Gesellschaft in St. Petersburg, St. Petersburg.
Pharmaceutisches Institut, Dorpat, Russia.
Pharmaceutical Institution, Stockholm, Sweden.
Kongelige Norske Universitet i Christiani.
Archiv for Pharmaci, S. M. Trier, Kjobenhavn.
Danmark's Apotheker Forening, Gust. Lodze, President, Odense.
Centro Pharmaceutico Portuguez, Porto, Portugal.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmaceutists and Druggists of the United States in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulteration.

2. To encourage proper relations between Druggists, Pharmaceutists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory, and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a Permanent Secretary, a Local Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom, with the exception of the Permanent Secretary, shall be elected annually, and shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the annual interest of which only shall be used by the Association for its current expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting; when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all meetings of the Association; in his absence or inability, one of the Vice-Presidents, or in the absence of all, a President pro tempore shall perform the duties of President.

ARTICLE II. In the absence of the Permanent Secretary, the President shall appoint a Recording Secretary pro tempore.

ARTICLE III. In meetings the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports, and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all ballotings, and on questions upon which the yeas and nays are taken, the President is required to vote, but his name should be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal, and in case of such equal division the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality or impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in cases where he prefers to submit the matter to the meeting; decide promptly who is to speak when two or more members rise at the same moment; and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor, in debate. He shall see that the Constitution and By-laws are properly enforced.

ARTICLE VII. He shall appoint all committees, unless provided for in the By-laws, or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasurer. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the Permanent Secretary.

ARTICLE I. The Permanent Secretary shall be elected to hold office permanently, during the pleasure of the Association. He shall receive from the Treasurer an annual salary of $600, and the amount of his expenses incident to the meeting in addition to his salary.

ARTICLE II. He shall preserve fair and correct minutes of the proceedings of the meetings, and carefully preserve, on file, all reports, essays, and papers of every description received by the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Proceedings of the Association, under the direction of the Executive Committee.

ARTICLE III. He shall read all papers handed him by the President for that purpose; shall call and record the yeas and nays whenever they are required to be called; shall notify the chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act; and shall notify every member of the time and place of each annual meeting.

ARTICLE IV. He shall be, ex-officio, a member of the Executive Committee.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall be elected annually, near the close of the Annual Meeting, and shall reside at or near the place where the next Annual Meeting of the Association is to be held.

ARTICLE II. He shall assist the Permanent Secretary in his duties; shall co-operate with any local committee in making arrangements for the Annual Meeting; shall correspond with the chairman of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Executive Committee, previous to each Annual Meeting, the names of such members as have failed to pay their annual contributions for three years, and also the names of such as have failed to return their certificates of membership after having been officially disconnected with the Association, and having been duly notified to return them.

ARTICLE IV. He shall present a statement of his accounts at each Annual Meeting, that they may be audited; he shall receive an annual salary of $500, and the amount of his expenses incident to the meeting in addition to his salary.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services such sum as may be annually determined upon.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the Permanent Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the Permanent Secretary for preservation.

ARTICLE III. From these and other available sources he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry, and Materia Medica, and the collateral branches of knowledge; on the changes in condition of Pharmaceutical Institutions, together with such statistical, biographical, and obituary notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented complete at the annual meeting.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the Permanent Secretary and the Chairman of the Executive Committee shall be required to make the best arrangements they can command, to continue the work to its completion.

CHAPTER VI.

Of Committees.

ARTICLE I. There shall be elected annually six standing committees: An Executive Committee, and a Committee on the Drug Market, each to consist of five members; a Committee on Papers and Queries, a Business Committee, a Committee on Prize Essays, and a Committee on Legislation; each to consist of three members.

ARTICLE II. The Executive Committee, of which the Permanent Secretary shall be a member, shall have charge of the revision of the Roll, the investigation of application for membership, and the publication of the Proceedings.

ARTICLE III. They shall report at each meeting a revised roll of members, with appropriate notices of deceased members, and the names of any who, having become disconnected with the Association, refuse to return their certificates of membership as provided by the By-laws.

ARTICLE IV. They shall furnish to each member of the Association not in arrears one copy of the annual publication of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sittings, the Reports of the President and of the Committees, together with such addresses, scientific papers, discussions, notices of new processes, and preparations, as the Executive Committee may deem worthy of insertion, and shall fix the price at which the Proceedings shall be sold.

ARTICLE V. The Committee on the Drug Market shall report annually the condition of the Drug Market, the fluctuations in the supply and demand of drugs and chemicals, the variations in quality, and the adulterations and sophistications coming under their observation or reported to them by others, with any suggestions or recommendations for the improvement or better regulation of the trade; and they shall be authorized to report upon any adulterations and sophistications of immediate interest, through the Pharmaceutical Journals, as soon as practicable after their discovery.

ARTICLE VI. The Committee on Papers and Queries shall receive all Reports of Standing Committees, and all papers for the Association. They shall designate which of them shall be read at length, or which by title, and shall be furnished with a synopsis of each by the authors. They shall, in connection with the Business Committee, arrange the time which may be most appropriate or convenient for reading them.

ARTICLE VII. The Committee on Papers and Queries shall report, near the close of each Annual Meeting, a proper number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE VIII. Any person writing a paper for the Association must, to insure its publication in the Proceedings, refer the same with a synopsis of its contents to the Committee on Papers and Queries previous to the third session.

ARTICLE IX. It shall be the duty of every Standing Committee making a report annually to the Association, in like manner to furnish a copy of the same, together with a synopsis of its contents, to the Committee on Papers and Queries, before the first annual session of the Association.

ARTICLE X. The Business Committee shall be charged with the transmission of unfinished business from one Annual Meeting to another, and with collecting, arranging, and expediting the business during the sessions of the Annual Meetings.

ARTICLE XI. The Committee on Prize Essays shall, within six months after the Annual Meeting at which the essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all other respects they shall be governed by the stipulations expressed by the donor. The decision of the committee, with such comments upon the successful essay only as they may deem proper, may be published in the journals of pharmacy.

ARTICLE XII. The Committee on Legislation shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. They shall report to each stated meeting of the Association what legislation on the subject has occurred during the year.

CHAPTER VII.

Of Membership.

ARTICLE I. Every pharmaceutist and druggist of good moral and professional standing, whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry, and Botany, who may be specially interested in Pharmacy and Materia Medica, who, after duly considering the objects of the Association and the obligations of its Constitution and By-laws, are willing to subscribe to them, are eligible to membership.

ARTICLE II. Any person eligible to membership may make application in writing, with the indorsement of any two members of the Association in good standing, to any member of the Executive Committee, who shall report his application to the said Committee.

If after investigating his claims they shall approve his election, they shall, at the earliest time practicable, report his name to the Association, and he may be elected by two-thirds of the members present on ballot.

ARTICLE III. No person shall be a member of this Association, nor shall his name be placed upon the roll, until he shall have signed the Constitution and paid into the Treasury the sum of *Five Dollars* as an initiation fee, and the annual contribution for the current year, with the exception of *Delegates*, as provided in Article VI of this chapter.

ARTICLE IV. Every member shall pay in advance to the Treasurer the sum of *Five Dollars* as his yearly contribution, and is liable to lose his membership by neglecting to pay said contribution for *three successive years.*

ARTICLE V. Any member who shall pay to the Treasurer the sum of *seventy-five dollars at one time*, shall become a life member and shall be exempt from all future annual contributions.

ARTICLE VI. All local organizations of Pharmacists shall be entitled to *five* delegates, as their representatives in the Annual Meetings, who, *if present*, become members of the Association on signing the Constitution and paying the annual contribution for the current year, without paying the usual initiation fee.

ARTICLE VII. Members shall be entitled, on the payment of *Five Dollars*, to receive a certificate of membership signed by the President, one Vice-President, Permanent Secretary, and Treasurer, at the same time covenanting to return the same to the proper officer on relinquishing their connection with the Association.

ARTICLE VIII. Persons constitutionally elected to membership become permanent members, and their membership can cease only by resignation, non-payment of dues, or by expulsion, as provided in these By-laws.

ARTICLE IX. Resignation of membership shall be made in writing to the Permanent Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported at the next Annual Meeting.

ARTICLE X. Any member may be expelled for improper conduct or the violation of the Constitution, By-laws, or Ethics adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at some regular session.

ARTICLE XI. Pharmaceutists, chemists, and other scientific men, who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office, or vote at the meetings.

CHAPTER VIII.

Of Meetings.

ARTICLE I. The meetings shall be held annually; provided, that in case of failure of this from any cause the duty of calling the Association together shall devolve upon the President or one of the Vice-Presidents, with the advice and consent of the Executive Committee.

ARTICLE II. The order of business at the first session of each Annual Meeting shall be as follows:

Section 1. Promptly, at the time named in the notice issued for the meeting, the President, or in his absence one of the Vice-Presidents, or in their absence a President pro tempore, shall officiate.

Section 2. In the absence of the Permanent Secretary the President shall

appoint a Recording Secretary pro tempore, who shall perform the duties of the Permanent Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President shall appoint a committee of three persons to examine the credentials of delegates, which committee shall attend to that duty. The President's address may then be read, after which the committee shall report to the Association as soon as practicable, when the Secretary shall call the roll, noting the names of the delegates and members in attendance.

Section 5. The Executive Committee shall present names recommended for membership, when the President, having ascertained that a quorum of members is present, shall order an election by ballot, and appoint two tellers.

Section 6. Reports of committees shall be presented, read by their titles, the synopsis, or in full, and laid on the table for future consideration.

Section 7. The President shall call the roll of Colleges and Associations represented, requesting each delegation in turn to appoint one member, the persons so selected to act as a committee to nominate officers and the Standing Committees for the ensuing year; in addition to which he shall appoint five members, who are not delegates, to act with the committee.

Section 8. The reports of the Executive Committee, of the Permanent Secretary, and of the Treasurer, shall be read by title or in full.

Section 9. A committee of five shall be appointed to examine and report upon specimens exhibited.

Section 10. Incidental business may be called up by the Business Committee.

Article III. The order of business at the second session of each Annual Meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding meeting, which may be amended if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall be read; when the President shall appoint tellers, and the Officers and Committees nominated shall be balloted for.

Section 4. The officers elected shall take their respective places.

Section 5. The Executive Committee shall present names recommended for membership, when a ballot shall be ordered for their election.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8 The second session shall close with the examination of specimens on exhibition.

Article IV. The order of business at subsequent sessions shall be determined by the Business Committee, with the consent of the Association.

CHAPTER IX.

Of Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the meeting, and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order in which they are arranged. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER X.

Miscellaneous.

ARTICLE I. In all such points of order as are not noticed in these By-laws the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-laws shall be submitted in writing, and may be balloted for at any subsequent session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-laws.

ARTICLE III. No one or more of these By-laws shall be suspended.

FORM OF APPLICATION FOR MEMBERSHIP.

Approving of the objects of the American Pharmaceutical Association, I am desirous of joining it in membership; and, having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them.

.....

Address,.....

I hereby agree to return my certificate of membership in the American Pharmaceutical Association to the Treasurer of that body, if I shall hereafter cease to be connected in membership with it.

.....

TESTIMONIALS.

The undersigned, members in good standing, being personally acquainted with of testify to his moral character, his skill as a practical Druggist and Pharmaceutist, and his professional probity and good standing, and they recommend him for membership in the American Pharmaceutical Association.

Name. Address.

ROLL OF MEMBERS.

HONORARY MEMBERS.

UNITED STATES OF AMERICA.

Daniel B. Smith,	Philadelphia,	Penn.,	1856.
George B. Wood, M.D.,	"	"	1857.

FOREIGN COUNTRIES.

AUSTRIA.

Anton von Waldheim, *Vienna*, 1871.

BELGIUM.

A. T. De Meyer, *Brussels*, 1868.
Norbert Gille, *Brussels*, 1868.

ENGLAND.

Dr. John Attfield, *London*, 1871.
Dr. Robert Bentley, *London*, 1872.
Henry B. Brady, *Newcastle-on-Tyne*, 1871.
Dr. J. Redwood, *London*, 1871.

FRANCE.

Dr. A. Chevalier, *Paris*, 1871.
Dr. J. Léon Soubeiran, *Montpellier*, 1871.
Dr. Augustin A. Délondre, *Sèvres*, 1871.
Stanislas Martin, *Paris*, 1872.
Dr. G. Planchon, *Paris*, 1877.

GERMANY.

Dr. Adolph Duflos, *Breslau*, 1871.
Dr. Hermann Hager, *Pulvermühle bei Fürstenberg*, 1868.
Dr. F. A. Flückiger, *Strassburg*, 1868.
Dr. Frederick Mohr, *Bonn*, 1868.
L. A. Wiggers, *Göttingen*, 1877.
Dr. G. C. Wittstein, *Munich*, 1868.

GREECE.

Xaver Landerer, 1877.

NETHERLANDS.

Dr. J. E. De Vrij, *Hague*, 1871.

RUSSIA.

Dr. G. Dragendorff, *Dorpat*, 1868.

SWITZERLAND.

Dr. Edward Schaer, *Zurich*, 1877.

ACTIVE MEMBERS.

☞ Members are requested to report any inaccuracies in these lists, and to notify the Secretary and Treasurer of all changes of address.

(The names of life members in SMALL CAPITALS. Names of life members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA.

Mobile.

Candidus, Philip Charles, . 1857
Mohr, Charles, ... 1871
Punch, William F., . . . 1874

ARKANSAS.

Hot Springs.

Brown, Charles Scott, . . 1873

CALIFORNIA.

San Francisco.

Calvert, John, ... 1870
Moffit, Thomas S., . . . 1861
Painter, Emlen, . . . 1870
Simpson, William, . . . 1870
Steele, Henry, ... 1859
Steele, James G., . . . 1859
Wenzell, William T., . . 1870

Alameda.

Elbe, C. B., ... 1877

Eureka, Humboldt Bay.

McKay, George J., . . . 1864

Marysville, Yuba Co.

Flint, John Henry, . . . 1873

Oakland.

Brown, Joseph John, . . 1876

San Jose.

Wagener, Samuel H., . . 1869

Vallejo, Solano Co.

Frost, James, ... 1870
Topley, James, ... 1869

COLORADO.

Central City.

Best, John, ... 1866

COLUMBIA, DISTRICT OF.

Georgetown.

Becker, Charles, . . . 1875

Washington.

Baldus, William Theodore, . 1872
Bannvart, Charles A., . . 1856
Berrian, George W., Jr., . . 1857
Bury, Edward Berkley, . . 1870
Christiani, Charles, . . . 1874
Christiani, Theodore, . . 1873
Cromwell, Zachariah William, 1870
Drew, John Waters, . . 1876
Duckett, Walter G., . . 1876
Dufour, Clarence R., . . 1876
Entwisle, William Burton, . 1873
Ferguson, Robert Benedict, . 1867
Heller, Peter Henry, . . 1871
Hickling, Daniel Percy, . . 1867
Kidwell, John Lawrence, . 1856
Knabe, Gustavus Alexander, . 1876
Lewis, Samuel Edwin, . . 1875
Major, John Richards, . . 1873
Milburn, John Alexander, . 1858
O'Donnell, James Dominic, . 1870
Oldberg, Oscar, . . . 1873
Price, Charles S., . . . 1876
Reinlein, Paul, ... 1856
Seala, William Franklin, . 1876
Schafhirt, Adolph J., . . 1876
Simms, Giles Green Craycroft, 1860

Taber, Edward Morris, . . 1874
Thompson, William Scott, . 1871
Tyson, Samuel Ellicott, . . 1857

CONNECTICUT.

Hartford.

Goodrich, Stephen, . . . 1875
Goodwin, Lester H., . . 1875
Lambe, John J., . . . 1868
Rapelye, Charles A., . . 1876
Wells, John C., . . . 1875
Williams, John K., . . . 1875

Danbury.

Perry, Frank V., . . . 1876

Litchfield.

Gates, Howard E., . . . 1873

Middletown.

Pitt, John R., Jr., . . . 1872

Naugatuck.

May, James O., . . . 1875

New Britain.

Main, Thomas Francis, . . 1872

New Haven.

Daggett, Alfred, Jr., . . 1865
Daggett, Henry, . . . 1871
Dimock, Robert H., . . . 1876
Kelsey, Henry, Jr., . . . 1873
Spalding, Warren A., . . 1876
Wells, Romanta, . . . 1877
Wood, Alonzo Fulton, . . 1876

Norwich.

Osgood, Hugh H., . . . 1875
Sevin, Nathan Douglass, . . 1875

Stamford.

Haight, William Bogardus, . 1872
Morrison, Samuel C., . . 1871

Wallingford.

Pickford, Thomas, . . . 1875

Waterbury.

Dikeman, Nathan, . . . 1859
Munson, Luzerne J., . . 1872
Woodruff, Roderick S., . . 1876

West Winsted.

Phelps, Dwight, . . . 1873

Winsted.

Renouff, James T., . . . 1877

DELAWARE.

Wilmington.

Belt, Zedekiah James, . . 1876
McInall, Edward, Jr., . . 1867
Shoemaker, Benjamin, . . 1867
Smith, Linton, ... 1870

FLORIDA.

Fort George.

Rollins, John Francis, . . 1859

Jacksonville.

Howarth, James L., . . . 1877

Monticello.

Palmer, John Dabney, . . 1875

GEORGIA.

Atlanta.

Daniels, John B., . . . 1871
Peacock, Frederick S., . . 1871
Rankin, Jesse Willis, . . 1877
Schumann, Theodore, . . 1860
Taylor, Walter Adolphus, . 1876

Augusta.

Chapman, Foster S., . . 1875
Land, Robert H., . . . 1859
Tarrant, Homer Post, . . 1875

Hawkinsville.

Fale, John, ... 1877

Macon.

Hall, Roland B., . . . 1877
Ingalls, John, ... 1876
Menard, Alexander Ambrose, . 1877

Milledgeville.

Clark, John M., . . . 1857
Grieve, Fleming G., . . . 1859
Cotting, William A., . . 1869

Rome.

Fenner, William R., . . 1871

ILLINOIS.

Allondale, Wabash Co.

Day, Charles W., . . . 1873

Bloomington.

Dyson, Dunbar S., . . . 1856

Bradford, Stark Co.

Plummer, David G., . . 1869

Chicago.

Bartlett, Nicholas Gray, . . 1864
Biroth, Henry, . . . 1865
Blocki, William F., . . . 1863
Borcherdt, Julius C., . . 1867
Borland, Matthew Wilson, . 1876
Buck, George, ... 1860
Ebert, Albert Ethelbert, . . 1864
Fox, Daniel S., . . . 1872
Fredigke, Charles Christian, . 1869
Fuller, Henry W., . . . 1865
Fuller, Oliver F., . . . 1869
Gale, Edwin O., . . . 1857
Gale, William H., . . . 1857
Garrison, Herod Daily, . . 1869
Heuermann, Henry W., . . 1869
Hogan, Louis C., . . . 1876
Hooper, John H., . . . 1865
Jacobus, Judson S., . . . 1870
Jamieson, Thomas N., . . 1869
Jauncey, William, . . . 1873
Krusemarck, Charles, . . 1876
Mahla, Frederick, . . . 1864
McPherson, George, . . . 1865
Mill, James W., . . . 1864
Milleman, Philip Lionel, . 1866
Palmer, Hosea W., . . . 1870
Parsons, John, ... 1865
Patterson, Theodore H., . . 1869
Reinhold, William, . . . 1866
Sargent, Ezekiel Herbert, . 1864
Sharp, J. Perine, . . . 1865
Strehl, Louis C., . . . 1866
Sweet, Henry, ... 1865
Vogeler, Adolf G., . . . 1876
Wheeler, C. Gilbert, . . 1876
Whitfield, Thomas, . . . 1865
Willard, Joseph, . . . 1865
Wilson, Julius H., . . . 1869
Woltersdorf, Louis, . . . 1865

Englewood, Cook Co.

Peirpoint, Newton, . . . 1869

Galesburg.

Clark, Albert B., Jr., . . 1868
Devendorf, Almond Smith, . 1872

Highland.

Mueller, Adolphus, . . . 1871

Mascoutah.

Henrich, George, . . . 1875

Okawville, Washington Co.

Streit, Alexander G. F., . . 1874

Peoria.

Singer, Peter J., . . . 1869

Quincy.

Schroder, Hermann, . . 1871

INDIANA.

Aurora.

Marshall, Hubert J., . . 1877

Fort Wayne.

Wright, William, Jr., . . 1859

Indianapolis.

Dryer, James W., . . . 1871
Kielhorn, Henry, . . . 1874
Schrader, Henry, . . . 1869
Sloan, George W., . . . 1857

Jeffersonville.

Loomis, John Clarence, . . 1876

Lawrenceburgh.

Ferris, Charles E., . . . 1874

Madison.

Harper, Frank M., . . . 1874

New Albany.

Conner, Jefferson S., . . 1876
Scribner, Benjamin Franklin, . 1858

Rushville.

Pugh, Finley B., . . . 1876

Tell City.

Schreiber, August, . . . 1876

Terre Haute.

Buntin, William C., . . 1874

IOWA.

Burlington.

Squires, C. P , ... 1876
Wigert, Carl R., . . . 1876

Davenport.

Ballard, John W., . . . 1871

Dubuque.

Ruete, Theodore W., . . 1870

Fort Dodge.

Oleson, Olaf Martin, . . 1877

Fort Madison.

Schaefer, George H., . . 1871

Iowa City.

Boerner, Emil Louis, . . 1877

Monticello.

Tiarks, Hermann, . . . 1876

Washington.

Ink, Parker P., . . . 1872

KANSAS.

Lawrence.

Leis, George, ... 1869

Leavenworth.

Harrop, Joseph, . . . 1869

KENTUCKY.

Catlettsburg.

Patton, William Allison, . . 1873

Covington.

Nodler, Peter, ... 1870
Zwick, George Gilbert, . . 1874

Frankfort.

Averill, William Henry, . . 1874

Hopkinsville.

Gray, Francis Marion, . . 1876

Lexington.

Frost, John J., . . . 1874
Richardson, Marius D., . . 1874

Louisville.

Bell, Gotthard Emmanuel, . 1874
Colgan, John, ... 1867
Davis, Vincent, . . . 1874
Diehl, Conrad Lewis, . . 1863
Huddart, John Fletcher, . . 1870
Jones, Simon Newton, . . 1870
Lingelbach, Ferdinand, . . 1874
McAfee, James Alexander, . 1874
Miller, Frederick Christopher, 1874
Mobley, Cyrus Lyman, . . 1874
Newman, George Abner, . . 1866
Pfingst, Edward Charles, . 1874
Pfingst, Ferdinand John, . 1867
Pfingst, Henry Adolph, . . 1874
Reynolds, John J., . . . 1876
Rogers, Wiley, ... 1874
Scheffer, Emil, ... 1872
Strassel, William, . . . 1870
Sutton, Ellsworth Septimus, . 1871
Sutton, Peter Priest, . . 1871
Wilder, Graham, . . . 1868

Maysville.

Blattermann, George W., . 1876

LOUISIANA.

New Orleans.

Flemmich, Dorie B., . . 1877
Genois, Louis, ... 1876
Girling, Robert N., . . . 1876

Keffer, William P., . . 1866
Lyons, Isaac L., . . . 1875

Bayou Goula.

Viallon, Paul L., . . . 1870

Gretna.

Langebecker, Charles O., . 1876

New Iberia.

Lee, James A., . . . 1856

Plaquemine.

Delavallade, John M., . . 1873

Thibodeaux.

Thibodeaux, Joseph G., . . 1870

Vidalia.

Schaaf, Justus Henry, . . 1875

MAINE.

Augusta.

Partridge, Charles K., . . 1867

Bangor.

Harlow, Noah Sparhawk, . 1859
Patten, John F., . . . 1871

Bath.

Anderson, Samuel, . . . 1876

Belfast.

Moody, Richard H., . . 1876

Biddeford.

Boynton, Herschell, . . . 1875

Eastport.

Shead, Edward Edes, . . 1866

Ellsworth.

Parcher, George A., . . 1875

Lewiston.

Cook, John G., . . . 1859
Wakefield, Seth D., . . . 1875

Portland.

Cummings, Henry T., . . 1853
Dana, Edmund, Jr., . . 1877
Hay, Henry H., . . . 1867
Jordan, William H., . . 1871
Phillips Walter F., . . . 1859
Preston, Alfred, Jr., . . 1873

Richmond.

Donnell, J. Woodbury, . . 1875

Searsport.

Curtis, Lebbens, . . . 1875

Waterville.

Plaisted, James H., . . . 1875

MARYLAND.

Baltimore.

Baxley, Jackson Brown, . . 1856
Beam, Isaac Richard, . . 1873
Brack, Charles, . . . 1876
Brown, Alexander E., . . 1863
Brown, William H., . . 1863
Dohme, Charles Emile, . . 1863
Dohme, Lewis, ... 1859
Donavin, Matthew W., . . 1867
Eareckson, Edwin, . . . 1875
Elliott, Henry Alexander, . 1859
Emich, Columbus Valentine, . 1863
Frames, James P., . . . 1868
Gossman, Adam J., . . . 1870
Hancock, John Francis, . . 1863
Hassencamp, Ferdinand, . . 1872
Jackson, Vincent Rodman, . 1876
Jefferson, John H. B., . . 1868
Jennings, Nathaniel Hynson, . 1857
Lauer, Michael John, . . 1865
Lautenbach, Robert, . . 1870
Lilly, Alonzo, Jr., . . . 1863
Mitnach, Henry, . . . 1873
Monsarrat, Oscar, . . . 1856
Moore, Jacob Faris, . . . 1856
Morrison, S. Ellwood, . . 1863
Muth, John Philip, . . . 1864
Osburn, William Henry, . . 1870
Perkins, Elisha Henry, . . 1857
Potts, Jesse Newport, . . 1870
Roberts, Joseph, . . . 1856
Russell, Eugene J., . . . 1856
Russell, Edward Walton, . 1863
Sappington, Richard, . . 1870

Sharp, Alpheus Phineas, . . 1855
Sylvester, Samuel Retallack, . 1858
Thienemann, Charles, . . 1876
Thompson, William Silver, . 1856
Thompson, William Partlow, . 1874
Thomsen, John J., . . . 1856
Tilyard, Charles Slade, . . 1867
Webb, John Alansen, . . 1870
Winkleman, John Henry, . 1864
Woodward, Samuel Morris, . 1874

Annapolis.

Button, Elijah, . . . 1870

Cumberland.

Rohrbach, Theodor, . . . 1876
Shriver, Henry, . . . 1876
Shryer, Thomas Wilson, . . 1875

Hagerstown.

Winter, Jonas, . . . 1863

MASSACHUSETTS.

Boston.

Babcock, James F., . . . 1875
Babo, Leopold, ... 1859
Barry, Daniel Edward, . . 1875
Bartlett, William Williams, . 1875
Bassett, Charles Harrison, . 1867
Bolles, William, . . . 1875
Boyden, Edward Cleveland, . 1874
Brown, Joseph Taylor, . . 1859
Brown, Joseph Taylor, Jr., . 1869
Burley, Edwin Porter, . . 1877
Burnett, Joseph, . . . 1852
Campbell, Isaac Towle, . . 1859
Canning, Henry, . . . 1865
Carter, Solomon, . . . 1865
Colcord, Samuel Marshall, . 1852
Colton, James Byers, . . 1865
Covell, Thomas Jefferson, . . 1864
Craig, John Smith, . . . 1875
Cutler, Edward Waldo, . . 1859
Davidson, Frank A., . . 1873
Doliber, Thomas, . . . 1859
Doolittle, Erastus Hubbard, . 1865
Drury, Linus Dana, . . . 1871
Eaton, Charles Irving, . . 1867
Folger, William Swain, . . 1875
Follansbee, Sherman, . . 1875
Fowle, Henry Dearborn, . . 1853
French, George Washington, . 1865
Fuller, Sumner Howard, . . 1875
Gilman, Samuel Kinsman, Jr., 1876
Gleeson, James Andrew, . . 1859
Gleeson, Michael Henry, . . 1859
Godding, John Granville, . 1875
Hatch, Frederick A., . . 1876
Henchman, Daniel, . . . 1853
Hoagland, Pratt Ralph, . . 1868
Horton, William Francis, . 1869
Hoyt, George Melvin, . . 1875
Jenkins, Luther Lincoln, . 1867
Jenks, Thomas Leighton, . 1875
Jones, James Taber, . . 1875
Kelly, Edward Samuel, . . 1871
Kent, Robert R., . . . 1855
Leary, Jeremiah Thomas, . 1869
Lincoln, Henry Ware, . . 1853
Littlefield, Alvah, . . . 1856
Lowd, John Colby, . . . 1871
Markoe, Geo. Frederick Holmes, 1863
Melvin, James Samuel, . . 1853
Merrick, John M., . . . 1875
Metcalf, Theodore, . . . 1857
Nowell, William Frederick, . 1867
O'Brien, James J., . . . 1875
Parker, Joseph Lyman, . . 1864
Patch, Edgar Leonard, . . 1872
Patten, Ichabod Bartlett, . . 1858
Restieaux, Thomas, . . . 1853
Ricker, George Dexter, . . 1858
Sears, George T., . . . 1875
Sewall, David Jewett, . . 1875
Sharples, Stephen Paschell, . 1875
Sheppard, Samuel Airus D., . 1865
Simson, Francis Cook, . . 1876
Smalley, Elijah, . . . 1860
Smith, Albert E., . . . 1875
Snow, Jesse Walker, . . 1875
Stoddard, George Howland, . 1877
Stowell, Daniel, . . . 1875
Talbot, James Stewart, . . 1873
Tompkins, Orlando, . . . 1859
Tower, Levi, Jr., . . . 1860
Trask, Charles M., . . . 1875

Turner, Thomas Larkin, . . 1853
Underwood, Charles G., . . 1865
Warren, George W., . . 1875
Webster, Stephen, . . . 1875
Wilkins, Daniel Gilbert, . . 1865
Wilson, Benjamin Osgood, . 1859
Winslow, Samuel W., . . 1875
Woodbridge, George Washington, 1859
Wright, William P., . . 1875

Andover.

Parker, George H., . . . 1874

Cambridge.

Hubbard, John H., . . . 1866
James, Thomas P., . . . 1857

Cambridgeport.

Bayley, Augustus R., . . 1859
Orne, Joel Stone, . . . 1859
Orne, Charles Parker, . . 1874
Thayer, Henry, . . . 1858

Charlestown.

Kettell, George Parker, . . 1867
Marshall, Ernest Clifton, . . 1875
Stacey, Benjamin Franklin, . 1860

Chelsea.

Buck, John, ... 1855

Chicopee.

Smith, Warren, . . . 1874

Clinton.

Holden, Henry Clay, . . 1870

Danvers.

Merrill, Walter S., . . . 1875

Dorchester.

Prescott, Horace Augustus, . 1875

Fall River.

Redfearn, John, . . . 1873

Fitchburg.

Choate, John, ... 1877

Great Barrington.

Lillie, Charles, ... 1875
Morgan, Richard Evan, . . 1875
Whiting, Frederick T., . . 1863

Greenfield.

Childs, Louis Marshall, . . 1875

Haverhill.

Carey, Edward Franklin, . 1875
Frothingham, Edward G., Jr., 1875

Hingham.

Hunt, James Lewis, . . . 1865

Hinsdale.

Plummer, George Bolton, . 1875

Holyoke.

Wild, Joseph Oscar, . . 1873

Lawrence.

Whitney, Henry M., . . 1859

Lowell.

Bailey, Frederick, . . . 1869
Butler, Freeman Hall, . . 1874
Hood, Charles I., . . . 1871
Kidder, Samuel, Jr., . . . 1859

Lynn.

Gordon, Edward Bertelle, . 1875
Proctor, Benjamin, . . . 1859
Tozzer, Samuel Clarence, . 1875

Medford.

Brigham, William Cleveland, . 1877
Clough, Thomas R., . . . 1875
Howard, Daniel H., . . . 1877

Middleboro.

Drake, Charles W., . . . 1873

Milford.

Rice, John Allen, . . . 1875

Monson.

Phipps, John Mellen, . . 1875

Nantucket.

Jaggar, Charles H., . . . 1875

Natick.

Daniels, Samuel Olney, . . 1875

New Bedford.

Blake, James E., . . . 1866

Hadley, Frank R., . . . 1872
Lawton Charles H., . . . 1873
Lawton, Horace A., . . . 1873
Shurtleff, Israel H., . . . 1875
Taylor, John P., . . . 1875

Newburyport.

Atkinson, Albert J., . . 1875

Newton Centre.

Noble, John J., . . . 1875
Williams, Joseph, . . . 1875

North Adams.

Griswold, William Henry, . 1874

Northampton.

Wells, Charles C., . . . 1876

Pittsfield.

Atwood, Luther Lee, . . 1876

Quincy.

Whall, Joseph Stokes, . . 1873

Rockland.

Denham, Charles Sumner, . 1875
Easton, Luther Waite, . . 1875
Estes, Joseph Joselyn, . . 1870

Rockport.

Blatchford, Eben, . . . 1857

Salem.

Nichols, Thomas B., . . 1876

Shelbourne Falls.

Baker, Edwin, ... 1875

Somerville.

Cowdin, George Henry, . . 1875
Flanagan, Lewis Cass, . . 1875

Springfield.

Alden, Charles P., . . . 1874
Ferree, Henry D., . . . 1875
Gray, William H., . . . 1877
Webber, Joseph T., . . . 1873

Taunton.

Marvel, Amos Francis, . . 1875

Ware.

Wilder, Frederick Wales, . 1875

Warren.

Harwood, Frank Lucian, . . 1875
Harwood, Lucian, . . . 1875

Worcester.

Burbank, George C., . . 1875
Bush, William, . . . 1875
Fairbanks, Harlan, . . . 1876
McConville, Thomas Aloysius, . 1864
Scott, David, ... 1855
Scott, Nelson R., . . . 1859
Willard, William Henry, . 1875

MICHIGAN.

Ann Arbor.

Eberbach, Ottmar, . . . 1869
Prescott, Albert B., . . . 1871

Battle Creek.

Wardell, Robert C., . . . 1860

Detroit.

Caldwell, James W., . . 1875
Holt, Alvin E., . . . 1873
Johnston, William, . . . 1860
Ronnefeld, Theodore, . . 1866
Somers, Frank G., . . . 1877
Vernor, James, ... 1866

East Saginaw.

Dunk, Alfred A., . . . 1867
Garrigues, Samuel S., . . 1855
Melchers, Henry, . . . 1869

Jackson.

Austin, George W., . . . 1865

Kalamazoo.

MacDonald, George, . . 1871

Monroe.

Sackett, Samuel M., . . . 1876

Saginaw City.

Keeler, William H., . . 1872
Moll, William, ... 1869

Schoolcraft.

James, George R., . . . 1869

Ypsilanti.

Morgan, James, . . . 1859

MINNESOTA.

St. Paul.

Sweeney, Robert Ormsby, . 1866

MISSISSIPPI.

Columbus.

Osborne, Hampden, . . . 1869

Jackson.

Ash, Matthew F., . . . 1856
Buck, John T., ... 1868

MISSOURI.

St. Louis.

Ahlbrandt, Henry E., . . 1877
Alexander, Maurice W., . . 1871
Bang, Charles, ... 1871
Blank, Alois, ... 1871
Blickhahn, George Henry, . 1871
Boehm, Solomon, . . . 1871
Brown, Charles Scott, . . 1873
Catlin, Ephron, . . . 1871
Catlin, Theron, . . . 1871
Chamberlain, Guilford T., . 1853
Crawford, William H., . . 1864
Crawley, Francis Xavier, . 1869
Curtman, Charles O., . . 1871
D'Amour, Otto, . . . 1871
Glenn, Thomas Smith, . . 1870
Good, James M., . . . 1871
Grandjean, Charles, . . . 1871
Grandjean, Eugene, . . . 1871
Grant, William R., . . . 1871
Guerdon, John, . . . 1871
Jones, Charles Kendall, . . 1867
Kalb, Theodore, . . . 1864
Kirkbride, Joseph Cooper, . 1869
Krebs, Hugo, ... 1871
Leitch, Arthur, ... 1860
Mallinckrodt, Edward, . . 1869
Meyer, Christian F. G., . . 1860
O'Gallagher, James, . . . 1858
Pfeiffer, Adolph, . . . 1876
Physick, Henry Sanford, . . 1870
Primm, Hubert, . . . 1855
Richardson, J. Clifford, . . 1871
Sander, Enno, ... 1858
Scheffer, Henry W., . . . 1863
Scholz, Philip, ... 1871
Sennewald, Ferdinand William, 1865
Sherman, Oliver G., . . 1869
Ude, George, ... 1871
Vardick, August H., . . 1874
Williamson, Edward J., . . 1876
Witte, L. Edward, . . . 1871

Chillicothe.

Boyce, Samuel F., . . . 1871

Hannibal.

Orynski, Leonardo, . . . 1871

Macon.

Field, Amos, ... 1871

Mexico, Adrian Co.

Llewellyn, John Frederick, . 1867

Trenton.

Featherston'h, Edward R., . 1871

Weston,

Parr, John C., ... 1856

NEBRASKA.

Omaha.

Goodman, Charles Frederick, . 1871

NEVADA.

Aurora.

Green, Alexander Alfred, . 1868

Virginia City.

Brackett, Aurick S., . . 1868
Perkins, William Alexander, . 1869

NEW HAMPSHIRE.

Allentown.

Hildreth, Charles Francis, . 1874

Concord.

Eastman, Charles Smith, . . 1874
Foster, Henry B., . . . 1874
Underhill, George Francis, . 1874

Dover.

Pinkham, Alonzo Taylor, . 1874
Rackley, Benjamin Franklin, . 1874
Tufts, Charles Augustus, . . 1856
Vickery, William Henry, . 1874

Exeter.

Merrill, Charles A., . . . 1858

Keene.

Appleton, George J., . . 1873

Lancaster.

Colby, Frank A., . . . 1876
Noyes, Parker Jewett, . . 1874

Littleton.

Morrill, Benjamin, . . . 1876

Manchester.

Miville, Francis Charles, . . 1877
Perry, Bayard Taylor, . . 1876

Nashua.

Russell, Elias Smith, . . 1875
Whitman, Nelson Samuel, . 1875

New Market.

Dearborn, George L., . . 1853

Portsmouth.

Marvin, Thomas Ellison Oliver, 1875
Thacher, Joseph Haven, . . 1859

Rochester.

Shaw, Stephen F., . . . 1876

Somersworth.

Jones, Charles Mortimer, . 1869
Moore, George, . . . 1859
Wingate, Jeremiah Young, . 1875

NEW JERSEY.

Bloomfield.

Scherff, John Philip, . . 1877

Burlington.

Vandegrift, John A., . . 1867

Camden.

Brown, Albert P., . . . 1870
Cochran, Samuel W., . . 1876
De la Cour, Joseph Lauriat, . 1870
Lee, Emmor H., . . . 1875
Sommers, Richard Miller, . 1876
Test, Alfred W., . . . 1870

East Orange.

Rumsey, Samuel Louis, . . 1876

Elizabeth.

Barnaby, Thomas J., . . 1870
Drake, Jonathan B., . . 1875
Oliver, William M., . . 1875

Elizabethport.

Frohwein, Richard, . . . 1867

Hobokcn.

Klussman, Hermann, . . 1876

Jersey City.

Abernethy, Maxwell, . . 1865
Cusack, Robert, . . . 1875
Dougherty, Samuel E., . . 1875
Finlay, Norman J., . . . 1875
Laird, William R., . . . 1867
Levering, P. Wharton, . . 1876
Mercein, James R., . . . 1865
Pauly, Christian, . . . 1875
Phillips, George W. C., . . 1871
White, George H., . . . 1868
Wienges, Conrad, . . . 1875

Moorestown.

Warrington, Charles W., . 1876
Worthington, J. Willits, . . 1873

Morristown.

Carrell, Eugene A., . . . 1875
Dalrymple, Charles Hoagland, 1860
McCarty, William, . . . 1873

Mount Holly.

Miller, Louis, ... 1874
White, Aaron Smith, . . 1860

Newark.

Bruguier, Francis, . . . 1876
Dreher, Ernest, . . . 1869
Havenstein, Alexander, . . 1870
Hitchcock, William Edwin, . 1875
Holzhauer, Charles, . . . 1873
Littell, William M., . . . 1870
Mills, Andrew M., . . . 1872
Nichols, Edward Payson, . 1870
Peters, Alexander C., . . 1868
Sayre, William Henry, . . 1877
Smith, Charles Bradley, . . 1868
Smith, Israel P., . . . 1876
Stamford, William H., . . 1876
Townley William M., . . 1875
Vandervoord, Ransford Wells, 1870
Van Gieson, Theron W., . . 1869
Van Winkle, Abraham W., . 1871

New Brunswick.

Rust, William, ... 1870

Orange.

Harlow, Wickham N., . . 1874
Parsons, Robert E., . . . 1877

Plainfield.

Reynolds, Howard Prescott, . 1875
Shaw, Robert Johnston, . . 1875
Vorhees, William H., . . 1868

South Amboy.

Jacques, George W., . . 1869

Trenton.

Mangold, George Adolph, . 1875
Rickey, Randal, . . . 1870

NEW MEXICO.

Santa Fé.

Krummeck, Jacob, . . . 1867

NEW YORK.

New York City.

Alsdorf, John, ... 1872
Ambler, Starr Hoyt, . . 1876
Atwood, Hermon W., . . 1873
Balluff, Paul, ... 1860
Balser, Gustavus, . . . 1875
Bedford, Peter Wendover, . 1859
Billings, Henry M., . . . 1869
Bischof, Albert Sigismund, . 1875
Bond, Joseph Romulus, . . 1876
Buehler, Edward Handy, . 1874
Burdge, Jacob U., . . . 1876
Campbell, Horace W., . . 1875
Carle, John, Jr., . . . 1860
Cassebeer, Henry A., . . 1858
Cassebeer, Henry A., Jr., . 1872
Chandler, Charles F., . . 1867
Close, Eldridge W., . . . 1874
Cohen, Louis S., . . . 1877
Cole, Theodore, . . . 1873
Creuse, Jules L. A., . . 1871
Currie, John H., . . . 1858
Davis, Benjamin, . . . 1869
Day, Walter De Forest, . . 1873
Dege, George F., . . . 1868
Ditman, Andrew J., . . 1868
Dung, Albert C., . . . 1872
Eimer, Charles, . . . 1872
Faber, John, ... 1857
Fairchild, Benjamin Thomas, . 1875
Fisher, William, . . . 1862
Fraser, Edward A., . . . 1873
Frey, John, ... 1865
Fougera, Edmund C., . . 1867
Frohwein, Theobald, . . 1862
Gardiner, Warren B., . . 1860
Gardner, Robert W., . . 1872
Gilmore, John W., . . . 1867
Gellatly, William A., . . 1858
Green, Thomas T., . . . 1858
Gridley, Junius, . . . 1853
Griffith, William H., . . 1874
Hale, Frederick, . . . 1855
Hancock, John Henry, . . 1870
Haviland, Henry, . . . 1857
Hays, David, ... 1867
Hebberling, Gottfried, . . 1867
Henes, William F., . . . 1876
Higgins, James S., . . . 1862
Hoffmann, Frederick, . . 1867
Hohenthal, Charles F. L., . 1865
Hudnut, Alexander, . . . 1857
Imhof, Henry, ... 1872

Jarrett, Henry Thomas, . . 1875
Johnson, Edward L., . . 1860
Kalish, Julius, ... 1875
Kiersted, Henry T., . . . 1856
Kimmel, Henry, . . . 1867
Krehbiel, Gustavus, . . . 1865
Lazell, Lewis T , . . . 1858
Lehlbach, Paul Frederick, . 1872
Lehn, Louis, ... 1874
Macmahan, Thomas Jackson, . 1871
Marsh, Edward H., . . . 1858
McIntyre, Byron F., . . 1876
McIntyre, Ewen, . . . 1873
McKesson, John, Jr., . . 1867
Milhau, Edward L., . . 1858
Molwitz, Ernest, . . . 1867
Morrison, Thomas O., . . 1876
Mortimer, William G., . . 1877
Neergaard, William, . . 1859
Osmun, Charles A., . . . 1868
Peixotto, Moses Levi Maduro, 1869
Pfingsten, Gustavus, . . 1873
Ramsperger, Gustavus, . . 1860
Reichard, F. Alfred, . . 1871
Rice, Charles, ... 1870
Rickseeker, Theodore, . . 1875
Robbins, Charles Albert, . . 1876
Robbins, Daniel C., . . . 1862
Royce, Lucien M., . . . 1866
Runyon, Edward Wheelock, . 1875
Sands, George G., . . . 1867
Scofield, James S., . . . 1867
Seabury, George J., . . . 1876
Seward, Daniel W., . . . 1874
Sheddon, John W., . . . 1859
Sheils, George E., . . . 1860
Skelly, James J., . . . 1866
Starr, Thomas, ... 1870
Tscheppe, Adolph, . . . 1876
Wanier, George S., . . . 1876
Weaver, James, . . . 1860
Weinman, Oscar C., . . 1873
Weismann, Augustus W., . 1869
Wellcome, Henry Solomon, . 1875
Wenck, George J., . . . 1869
Westerfield, Joseph H., . . 1858
Wheeler, Lucian F., . . . 1858
White, Philip A., . . . 1872
Wickham, William Hull, . 1870
Wilson, William, . . . 1876
Zellhoefer, George, . . . 1876

Brooklyn.

Althans, Charles Henry, . . 1873
Barnaby, James Otis, . . 1870
Bassett, Francis M., . . . 1860
Booth, Clarence Frederick, . 1875
Chadwick, Alexander B., . 1872
Close, George C., . . . 1858
Curtiss, Charles Grenville, . 1866
Cutts, Foxwell Curtis, Jr., . 1875
Day, Carlos E., . . . 1870
Daycock, William Henry, . 1874
Dennin, Charles, . . . 1875
Douglass, Henry, Jr., . . 1875
Dudley, Oscar E., . . . 1877
Dunn, John A., . . . 1867
Dupuy, Eugene, . . . 1852
Harner, James M., . . . 1867
Heydenreich, Emile, . . 1867
Heydenreich, F. Victor, . . 1860
Jones, Thomas, . . . 1868
Kitchen, Charles W., . . 1865
Krieger, Philip, . . . 1876
Lawlor, Charles J., . . . 1874
Levy, Adolph, ... 1877
Lewis, Thomas, . . . 1867
Livingston, Borent V. B., . 1872
McElhenie, Thomas D., . . 1872
Menninger, Henry J., . . 1866
Newman, George A., . . 1865
Nicot, Louis Edgar, . . . 1875
Niebrugge, John August, . . 1861
Nietsch, Adolph J. W., . . 1872
Ollif, James H., . . . 1867
Owens, Richard J., . . . 1860
Peduzzi, George S., . . . 1861
Pyle, Cyrus, ... 1859
Raas, Francis, ... 1877
Rideout, James W., . . . 1875
Sayre, Edward A., . . . 1877
Snyder, Ambrose C., . . . 1867
Squibb, Edward R , . . . 1858
Tartis, Alfred J., . . . 1867

Ubert, Julius, ... 1876
Vincent, William, . . . 1870
Wendler, Robert, . . . 1876
Wynn, William, . . . 1867

Angola, Erie Co.

Oatman, Le Roy S., . . . 1872

Buffalo.

Fischer, Edward J., . . . 1875
Peabody, William H., . . 1857
Rano, Charles O., . . . 1866
Tibbs, William H., . . . 1871

Fishkill, on Hudson.

Moith, Augustus Theodore, . 1860

Flushing.

Hepburn, John, . . . 1873

Geddes, Onondaga Co.

Belden, James L., . . . 1874

Luzerne, Warren Co.

Miller, George Yenington, . 1872

Middletown.

King, James Theodore, . . 1859
Rogers, William Henry, . . 1869

Mount Vernon.

Gill, George, ... 1872

New Lebanon.

Tilden, Henry A., . . . 1858

Niagara Falls.

Griffith, Hiram E., . . . 1875

Norwich.

Torrey, Charles Edward, . . 1876

Plattsburgh.

Cady, Hiram Walworth, . . 1870

Port Chester.

Hyler, William Henry, . . 1875

Port Jervis.

Cook, George E., . . . 1872
McDougall, James, . . . 1874

Potsdam.

Thatcher, Hervey D., . . 1865

Poughkeepsie.

Brown, George R., . . . 1876
Sherwood, Hezekiah Shorey, . 1870

Rochester.

Haas, George Herman, . . 1872
Lane, Alfred S., . . . 1857
Paine, James D., . . . 1857

Rome.

Bissell, John G., . . . 1875
Broughton, A. J., . . . 1876

Rondout.

Laycock, Washington, . . 1857

Sag Harbor.

Lobstein, Jacob Fred. Daniel, . 1868

Saratoga Springs.

Fish, Charles F., . . . 1866
Fish, George H., . . . 1869
Gates, Burt P., ... 1877
Gates, Carroll E., . . . 1877
Lamberton, John F., . . 1872
Mingay, James, . . . 1873
Pennington, T. H. Sands, . 1877

Spencerport.

Milliner, William S., . . 1877

Syracuse.

Dawson, Edward Seymour, Jr., 1876
Snow, Charles W., . . . 1876

Tompkinsville, L. I.

Basset, John W., . . . 1875

Troy.

Knowlson, Alexander M., . 1875
Sliter, Albert H., . . . 1875

Utica.

Ballard, George Shepard, . 1874
Howarth, John W., . . . 1874

West Farms.

Webb, Henry E., . . . 1865

Yonkers.

Stephens, William G., . . 1860
Toplis, Robert J., . . . 1863

NORTH CAROLINA.

Chapel Hill.

Saunders, Richard B., . . 1858

Charlotte.

Smith, Thomas C., . . . 1876

Fayetteville.

Hinsdale, Samuel J., . . 1875

Raleigh.

Lee, Addison Sherwin, . . 1873
Simpson, William, . . . 1873

Washington.

Gallagher, Charles K., . . 1857
Gallagher, James M., . . 1875

OHIO.

Cincinnati.

Bain, Andrew W., . . . 1874
Eger, George, ... 1864
Feemster, Joseph H., . . 1873
Fennel, Adolphus, . . . 1864
Foertmyer, Adolphus W., . 1864
Fratz, John G., . . . 1864
Gordon, William John Maclester, 1854
Greve, Theodore L. A., . . 1864
Heinemann, Otto, . . . 1864
Helman, Charles M., . . 1864
Hill, Alfred C., . . . 1864
Hottendorf, Augustus, . . 1864
Judge, John F., . . . 1866
Karrmann, William, . . 1864
Koehnken, Herman Henry, . 1875
Keeshan, John, . . . 1864
Lloyd, John Uri, . . . 1870
Markward, James, . . . 1864
Merrell, William S., . . . 1854
Rendigs, Charles Peter, . . 1876
Reum, Herman F., . . . 1864
Schwab, Louis, ... 1876
Wagner, Henry, . . . 1876
Wangler, Conrad D., . . 1876
Wayne, Edward S., . . . 1854
Wells, Jacob David, . . 1864
Yorston, Matthew Mackay, . 1864

Akron.

Armstrong, Andrew Moorehouse, 1876

Alliance.

Barr, Peter H., . . . 1867

Ashland.

Foltz, William K., . . . 1872

Bryan.

Snyder, Alva L., . . . 1873

Canton.

Geiger, Walter P., . . . 1867

Chillicothe.

Howson, Walter H., . . 1875

Circleville.

Fickardt, George H., . . 1864

Cleveland.

Gaylord, Henry C., . . . 1869
Hartness, William H., . . 1872
Hopp, Lewis C., . . . 1876
Huling, Bruce, ... 1872
Mayell, Alfred, . . . 1872
Moore, James Penn, . . 1872
Scott, William J., . . . 1872
Spenzer, Peter J., . . . 1872
Vaupel, Charles P., . . . 1872

Columbus.

Boyd, Abraham, . . . 1869
Huston, Charles, . . . 1872
Ritson, Alfred, ... 1870

Fredericktown.

Jefferson, William E., . . 1875

Ironton.

Ball, Theophilus B., . . . 1874

Logan.

Harrington, Frank, . . . 1869

Massillon.

Baltzly, Zachariah T., . . 1876

Middletown.

Hatfield, Vermont, . . . 1874
Johnson, Charles B., . . 1876

Navarre.

Grossklaus, John F., . . 1859

Salem, Columbiana Co.

Hawkins, M. Smith, . . 1870

Sandusky.

Graham, William A., . . 1876

South Charleston.

Armstrong, George R., . . 1877

Springfield.

Casper, Thomas J., . . . 1867
Ludlow, Charles, . . . 1872
Smith, Charles G., . . . 1874
Stout, William A., . . . 1875

Toledo.

Hohley, Charles, . . . 1872

Wooster.

Ohliger, Lewis P., . . . 1871

OREGON.

Portland.

Hodge, Charles, . . . 1859

PENNSYLVANIA.

Philadelphia.

Abell, Walter B., . . . 1867
Angney, John R., . . . 1867
Bakes, William C., . . . 1864
Bauer, Louis G., . . . 1867
Biddle, Charles Johnson, . . 1875
Blair, Andrew, . . . 1865
Blair, Henry C., . . . 1868
Blinkhorn, George, . . . 1860
Borell, Henry Augustus, . . 1874
Boring, Edwin McCurdy, . 1867
Bossler, David Jervis, . . 1873
Bower, Henry, ... 1860
Bower, Henry A., . . . 1868
Bowker, James, . . . 1876
Bullock, Charles, . . . 1857
Bunting, Samuel S., . . . 1857
Burroughs, Silas Mainevielle, . 1876
Campbell, Hugh, ... 1876
Campbell, Samuel, . . . 1864
Chapman, Samuel, . . . 1857
Cook, Thomas P., . . . 1877
Coombe, Thomas R., . . 1860
Cramer, Henry, . . . 1867
Dobbins, Edward T., . . 1867
Eberle, Charles Louis, . . 1865
Eddy, Henry C., . . . 1869
Eldridge, George W., . . 1865
Ellis, Evan T., ... 1857
England, Robert, . . . 1868
Erben, John S., . . . 1868
Fox, Peter Paul, . . . 1869
Früh, Carl D. S., . . . 1876
Gaillard, Edward, . . . 1876
Gerhard, Samuel, . . . 1873
Grahame, Israel J., . . . 1856
Grove, John E., . . . 1868
Haenchen, Charles Eugene, . 1865
Hance, Edward H., . . . 1857
Hancock, Charles West, . . 1868
Hazlett, Edward Everett, . 1876
Heintzelman, Joseph A., . . 1858
Hurst, John C., . . . 1868
Jenks, William J., . . . 1858
Johnson, Benjamin F., . . 1859
Jones, Alexander H., . . 1874
Jones, Daniel S., . . . 1859
Jones, Edward Charles, . . 1864
Kay, Isaac H., ... 1870
Keasbey, H. G., . . . 1873
Keeney, Caleb R., . . . 1868
Keys, Roger, ... 1868
Kline, Mahlon N., . . . 1876
Koch, Louis, ... 1872
Kolp, Christopher Henry, . 1876
Krewson, William Egbert, . 1875

Lindewald, Wilhelm Edvard, . 1877
Lippincott, Henry B., . . 1868
Magill, Benjamin Morris, . 1876
Maisch, John M., . . . 1856
Mattern, William Kline, . . 1876
Mattison, Richard V., . . 1873
McIntyre William, . . . 1868
McKelway, George Irvin, . 1874
Mellor, Alfred, ... 1864
Miller, Adolphus W., . . 1868
Milligan, Decatur, . . . 1867
Mitchell, Charles L., . . 1874
Moore, Joachim Bonaparte, . 1860
Moorhead, William Walker, . 1876
Murray, Francis Marion, . . 1876
Needles, Caleb H., . . . 1868
Newbold, Thomas M., . . 1876
Ottinger, James J., . . . 1876
Parrish, Clemmons, . . . 1868
Parrish, Dillwyn, . . . 1857
Patterson, James Lemon, . 1876
Perot, T. Morris, . . . 1857
Pile, Wilson H., . . . 1857
Post, Elisha, ... 1876
Power, Frederick B., . . 1872
Preston, David, . . . 1868
Procter, Wallace, . . . 1874
Remington, Joseph P., . . 1867
Riley, Charles W., . . . 1868
Rittenhouse, Henry N., . . 1857
Robbins, Alonzo, . . . 1865
Roche, Edward Manning, . 1868
Roche, William Ford, . . 1868
Rosengarten, Mitchell G., . 1869
Scattergood, George J., . . 1860
Selfridge, Matthew M., . . 1858
Shaw, Louis, ... 1877
Shivers, Charles, . . . 1860
Shinn, James Thornton, . . 1860
Shoemaker, Joseph L., . . 1867
Shoemaker, Richard M., . . 1869
Shryock, Allen, . . . 1868
Simpers, J. Wilmer, . . 1874
Snowdon, George M., . . 1857
Souder, Joseph A., . . . 1870
Spannagel, Charles C., . . 1874
Taylor, Alfred B., . . . 1852
Taylor, Henry Burnes, . . 1876
Thompson, William B., . . . 1858
Tilge, Frederick A., . . 1868
Trimble, Henry, . . . 1876
Troth, Samuel F., . . . 1857
Vogelbach, Hermann Augustus, 1868
Warner, William R., . . 1857
Weaver, J. Thornton, . . 1868
Webb, William H., . . . 1867
Weber, William, . . . 1872
Weidemann, Charles A., . . 1868
Wendel, Henry Edward, . . 1873
Wiegand, Thomas S., . . 1857
Wilder, Hans M., . . . 1866
Wilson, Adam H., . . . 1859
Wright, Archibald W., . . 1868
Zeilin, John Henry, . . . 1859

Allegheny City.

Brill, William H., . . . 1872
Eggers, Frederick Hermann, . 1872
Lutz, Harrison S., . . . 1872

Beaver, Beaver Co.

Andriessen, Hugo, . . . 1875

Bethlehem.

Luckenback, Edward Hermann, 1870
Meyers, Edward Tobias, . . 1867

Carlisle.

Horn, Wilbur F., . . . 1876

Chambersburg.

Cressler, Charles H., . . 1868
Heyser, William, Jr., . . 1856

Columbia.

Meyers, James Alfred, . . 1867

Easton.

Weaver, John A., . . . 1873

Erie.

Nick, William Frederick, Jr., . 1869

Harrisburg.

Finney, Thomas J., . . . 1874
George, Charles T., . . . 1873
Miller, Jacob Augustus, . . 1873

Hyde Park, Luzerne Co.

Morgan, Benjamin George, . 1876

Lancaster.

Heinitsh, Charles A, . . 1857

Lebanon.

Kareh, Joseph J., . . . 1876
Lemberger, Joseph L., . . 1858

Lewisburg, Union Co.

Schaffle, Samuel Wilson Wykoff, 1876

Mansfield, Allegheny Co.

Christy, Robert, . . . 1871

Marietta.

Wike, Albert D., . . . 1876

Minersville.

Burns, J. Kellar, . . . 1876

Oil City.

Griffith, Albert R., . . . 1870

Pittsburg.

Abel, Joseph, ... 1864
Cherry, James B., . . . 1868
Holland, Samuel Smith, . . 1876
Hostetter, Charles M., . . 1870
Kerr, James, Jr., . . . 1876
Ottinger, Franklin, . . . 1871

Pittston.

Rhoades, Stephen Howard, . 1876

Pottstown.

Cunningham, John McCoy, . 1867

Pottsville.

Kennedy, George Washington, 1869

Quakertown.

Penrose, Stephen F., . . 1871

Reading.

Raser, John B., . . . 1872
Stein, Jacob H., . . . 1869
Ziegler, Philip Milton, . . 1867

Sharon, Mercer Co.

Dame, Samuel Page, . . 1876

Tamaqua.

Albrecht, Emil, . . . 1875

West Chester.

Evans, Joseph S., . . . 1877

Wilkesbarre.

Holmes, Clay W., . . . 1873

Williamsport.

Cornell, Edward A., . . 1873
Duble, Jesse Balderston, . . 1870

RHODE ISLAND.

East Greenwich.

Congdon, Albert J., . . . 1860

Newport.

Blackman, Lyman Rawson, . 1865
Cotton, William Henry, . . 1875
Frost, William A., . . . 1875
Taylor, James Henry, . . 1875

Providence.

Blanding, William B., . . 1875
Boutelle, William E., . . 1876
Calder, Albert L., . . . 1859
Cone, John W., . . . 1876
Davis, George W., . . . 1875
Mason, Norman Nelson, . . 1875
Reynolds, William K., . . 1876

Westerley.

Latimer, Robert F., . . . 1857

Wyoming.

Greene, George E., . . . 1875

SOUTH CAROLINA.

Aiken.

Harbers, William Henry, . 1875

Charleston.

Burnham, Edward S., . . 1874
Eckel, Augustus W., . . 1874
Gibson, William A., . . 1874
Luhn, Gustavus Johann, . . 1873
Michaelis, Charles Otto, . . 1874
Moise, Benjamin Franklin, . 1876
Paunknin, Charles F., . . 1874

TENNESSEE.

Bolivar.

Larwill, Joseph H., Jr., . . 1858

Knoxville.

Albers, George W., . . . 1872

Memphis.

Fahlen, James, ... 1876
Hoerner, Theodore, . . . 1871
Robinson, James S., . . . 1869
Safford, William B., . . . 1875
Steever, Henry C., . . . 1865

Nashville.

Haddox, James B., . . . 1876
Laurent, Eugene L., . . 1872
Thomas, James, Jr., . . 1875
Wharton, John Criddle, . . 1872
Wharton, William H., . . 1876

TEXAS.

Austin.

Morley, William J., . . 1876

Fort Worth.

Powell, Thomas W., . . 1874

Galveston.

Thompson, T. C., . . . 1876

Lewisville, Denton Co.

Connor, L. Myers, . . . 1874

VERMONT.

Brandon.

Crossman, George A., . . 1872

Burlington.

Van Patten, William J., . . 1876

Ludlow.

Sherman, Linus Etias, . . 1875

Morrisville.

Gates, Amasa O., . . . 1876

Rutland.

Higgins, Albert W., . . 1870
Lewis, Elam C., . . . 1870

St. Johnsbury.

Bingham, Charles Calvin, . 1875
Randall, George Dallas, . . 1875

Vergennes.

Young, John Edward, . . 1875

West Rutland.

Morse, Franklin Alvah, . . 1876

Windsor.

Paine, Milton Kendall, . . 1875

VIRGINIA.

Alexandria.

Lunt, Samuel H., . . . 1873
Stabler, Richard H., . . . 1856

Fredericksburg.

Hall, Marshall C., . . . 1870

Harrisonburg.

Avis, James L., . . . 1873

Lynchburg.

Craighill, Edward A., . . 1876
Lumsden, Charles H., . . 1875
Strother, William A., . . 1874

Norfolk.

Burgess, Edward, . . . 1876
Burrow, John W., . . . 1873
Masi, Frederick Henry, . . 1873
Taylor, William A. S., . . 1873
Underhill, Charles F., . . 1876

Petersburg.

Goodwyn, John W., . . 1873

Richmond.

Anthony, Joseph, . . . 1873
Baker, Thomas Roberts, . . 1873
Blunt, Ira Washington, . . 1873
Bodeker, Henry, . . . 1873
Conrad, William Alexander S., 1873
Dupuy, Powhatan Eldridge, . 1873
Meade, Richard Hardaway, . 1873
Miller, Polk, ... 1876
Nesbitt, Charles Albert, . . 1873
Nolting, Adolphus William, Jr., 1870
Purcell, John B., . . . 1875
Scott, Albert Augustus, . . 1873
Scott, William Henry, . . 1873

Taliaferro, Edwin Conway, . 1876
Wagner, Louis, . . . 1873
Willis, Joseph Norment, . . 1873

Unionville, Orange Co.

Chipman, Edward D., . . 1872

WEST VIRGINIA.

Charleston.

Boggs, Edwin L., . . . 1872

Wheeling.

Bocking, Edmund, . . . 1874
Hartung, Hugo R., . . . 1876
Young, Alexander S., . . 1876

WISCONSIN.

Beloit.

Collins, Charles Frederick Gove, 1859

Chippewa Falls.

Jesson, Jacob, ... 1872

Janesville.

Heimstreet, Edward Burton, . 1874

Kenosha.

Prentice, Frederick F., . . 1876

Maxomanie.

Senier, Frederick S., . . 1874

Milwaukee.

Drake, John R., . . . 1860
Schrank, Henry C., . . . 1876

Watertown.

Eberle, Herman T., . . . 1875

DOMINION OF CANADA.

QUEBEC.

Montreal.

Gray, Henry R., . . . 1867
Lowden, John, ... 1875
Lyman, Benjamin, . . . 1875
Lyman, Stephen Jones, . . 1875

ONTARIO.

Belleville.

Yeomans, Lewis W., . . 1876

Caledonia.

Walker, John A., . . . 1873

Goodrich.

Jordan, Frederick, . . . 1877

Guelph.

Petrie, Alexander Bain, . . 1867

Lindsay.

Gregory, Edmund, . . . 1875

London.

Bowman, James, . . . 1876
Mitchell, Bossom Ashford, . 1877
Saunders, William, . . . 1860
Williams, Joseph, . . . 1875

Stratford.

Waugh, George J., . . . 1862

Toronto.

Elliot, William, . . . 1877
Harvey, Edmund, . . . 1877
Henderson, John, . . . 1877
Hodgetts, George, . . . 1877
Knowles, Harvey A., . . 1877
Lander, John C., . . . 1877
Massey, George, . . . 1877
Robinson, William S., . . 1877
Rose, Henry J., . . . 1872
Shuttleworth, Edward B., . 1877

BERMUDA.

Hamilton.

Heyl, James B., . . . 1863

U. S. OF COLOMBIA.

Panama.

Herbruger, Florence C., . . 1867

ALPHABETICAL LIST OF ACTIVE MEMBERS.

Abel, Joseph, Pittsburg, Pa.
Abell, Walter B., Philadelphia, Pa.
Abernethy, Maxwell, Jersey City, N. J.
Ahlbrandt. Henry E., St. Louis, Mo.
Albers, George W., Knoxville, Tenn.
Albrecht. Emil, Tamaqua, Pa.
Alden, Charles P., Springfield, Mass.
Alexander, Maurice W., St. Louis, Mo.
Aldsdorf, John, New York, N. Y.
Althans, Charles H., Brooklyn, N. Y.
Ambler, Starr H., New York, N. Y.
Anderson, Samuel, Bath, Me.
Andriessen, Hugo, Beaver, Beaver County, Pa.
Angney, John R., Philadelphia, Pa.
Anthony, Joseph, Richmond, Va.
Appleton, George J., Keene, N. H.
Armstrong, Andrew M., Akron, O.
Armstrong, George R., South Charleston, O.
Ash, Matthew F., Jackson, Miss.
Atkinson, Albert J., Newburyport, Mass.
Atwood, Hermon W., New York.
Atwood, Luther L., Pittsfield, Mass.
Austin, George W., Jackson, Mich.
Averill, William H., Frankfort, Ky.
Avis, James L., Harrisonburg, Va.
Babcock, James F., Boston, Mass.
Babo, Leopold, Boston, Mass.
Bailey, Frederick, Lowell, Mass.
Bain, Andrew W., Cincinnati, O.
Baker, Edwin, Shelbourne Falls, O.
Baker, T. Roberts, Richmond, Va.
Bakes, William C., Philadelphia, Pa.
Baldus, William T., Washington, D. C.
Ball, Theophilus B., Ironton, O.
Ballard, George S., Utica, N. Y.
Ballard, John W., Davenport, Iowa.
Balluff, Paul, New York.
Balser, Gustavus, New York.
Baltzly, Zacharias, T., Massillon, O.
Bang, Charles, St. Louis, Mo.
Bannvart, Charles A., Washington, D C.
Barnaby, James O., Brooklyn, N. Y.
Barnaby, Thomas J., Elizabeth, N. J.
Barr, Peter H., Alliance, O.
Barry, Daniel E., Boston, Mass.
Bartlett, Nicholas G., Chicago, Ill.
Bartlett, William W., Boston, Mass.
Bassett, Charles H., Boston, Mass.
Bassett, Francis M., Brooklyn, N. Y.
Bassett, John W., Tomkinsville, L. I., N. Y.
Baner, Louis G., Philadelphia, Pa.
Baxley, J. Brown, Baltimore, Md.
Bayley, Augustus R., Cambridgeport, Mass.
Beam, Isaac R., Baltimore, Md.
Becker, Charles, Georgetown, D. C.
Bedford, P. Wendover, New York.
Belden, James L., Geddes, N. Y.
Bell, Gotthard E , Louisville, Ky.
Belt, Z. James, Wilmington, Del.
Berrian, George W., Jr., Washington, D. C.
Best, John, Central City, Col.
Biddle, Charles Johnson, Philada.
Billings, Henry M., New York.
Bingham, Charles C., St. Johnsbury, Vt.
Biroth, Henry, Chicago, Ill.
Bischof, Albert S., New York.
Bissell, John G., Rome, N. Y.

Blackman, Lyman R., Newport, R. I.
Blair, Andrew, Philadelphia, Pa.
Blair, Henry C., Philadelphia.
Blake, James E., New Bedford, Mass.
Blanding, William B., Providence, R. I.
Blank, Alois, St. Louis, Mo.
Blatchford, Eben, Rockport, Mass.
Blatterman, George W., Maysville, Ky.
Blickhahn, George H., St. Louis, Mo.
Blinkhorn, George, Philadelphia, Pa.
Blocki, William F., Chicago, Ill.
Blunt, Ira W., Richmond, Va.
Bocking, Edmund, Wheeling, W. Va.
Bodeker, Henry, Richmond, Va.
Boehm, Solomon, St. Louis, Mo.
Boerner, Emil L., Iowa City, Ia.
Boggs, Edwin L., Charleston, W. Va.
Bolles, William P., Boston, Mass.
Bond, Joseph R., New York.
Booth, Clarence F., Brooklyn, N. Y.
Borell, Henry A., Philadelphia, Pa.
Borcherdt, Julius C., Chicago, Ill.
Boring, Edwin M., Philadelphia, Pa.
Borland, Matthew W., Chicago, Ill.
Bossler, David J., Philadelphia, Pa.
Boutelle, William E., Providence, R. I.
Bower, Henry, Philadelphia, Pa.
Bower, Henry A., Philadelphia, Pa.
Bowker, James, Philadelphia, Pa.
Bowman, James, London, Ont., Can.
Boyce, Samuel F., Chillicothe, O.
Boyd, Abraham, Columbus, O.
Boyden, Edward C., Boston, Mass.
Boynton, Herschell, Biddeford, Maine.
Brack, Charles, Baltimore, Md.
Brackett, Aurick S., Kansas City, Mo.
Brigham, William C., Medford, Mass.
Brill, William H., Allegheny City, Pa.
Broughton, Alfred J., Rome, N. Y.
Brown, Albert P., Camden, N. J.
Brown, Alexander E., Baltimore, Md.
Brown, Charles S., Jackson, Miss.
Brown, George R., Poughkeepsie, N. Y.
Brown, Joseph J., Oakland, Cal.
Brown, Joseph T., Boston, Mass.
Brown, Joseph T., Jr., Boston, Mass.
Brown, William H., Baltimore, Md.
Bruguier, Francis, Newark, N. J.
Buck, George, Chicago, Ill.
Buck, John, Chelsea, Mass.
Buck, John T., Jackson, Miss.
Buehler, Edward H., New York.
Bullock, Charles, Philadelphia, Pa.
Buntin, William C., Terre Haute, Ind.
Bunting, Samuel S., Philadelphia, Pa.
Burbank, George G., Worcester, Mass.
Burdge, Jacob U., New York.
Burgess, Edward, Norfolk, Va.
Burley, Edwin P., Boston, Mass.
Burnett, Joseph, Boston, Mass.
Burnham, Edward S., Charleston, S. C.
Burns, J. Kellar, Minersville, Pa.
Burroughs, Silas M., Philadelphia.
Burrow, John W., Norfolk, Va.
Bury, Edward B., Washington, D. C.
Bush, William, Worcester, Mass.
Butler, Freeman H., Lowell, Mass.
Button, Elijah, Annapolis, Md.
Cady, Hiram W., Plattsburg, N. Y.
Calder, Albert L , Providence, R. I.
Caldwell, James W., Detroit, Mich.
Calvert, John, San Francisco, Cal.
Campbell, Horace W., New York.
Campbell, Hugh, Philadelphia, Pa.
Campbell, Isaac T., Boston, Mass.
Campbell, Samuel, Philadelphia, Pa.
Candidus, Philip C , Mobile, Ala.
Canning, Henry, Boston, Mass.
Carey, Edward F., Haverhill, Mass.
Carle, John, Jr., New York.
Carrell, Eugene A., Morristown, N. J.
Carter, Solomon, Boston, Mass.
Casper, Thomas J., Springfield, O.
Cassebeer, Henry A., New York.
Cassebeer, Henry A., Jr., New York.
Catlin, Ephron, St. Louis, Mo.

Catlin, Theron, St. Louis, Mo.
Chadwick, Alexander B., Brooklyn, N. Y.
Chamberlain, Guilford T., St. Louis, Mo.
Chandler, Charles F., New York.
Chapman, Foster S , Augusta, Ga.
Chapman, Samuel, Philadelphia.
Cherry, James B., Pittsburg, Pa.
Childs, Louis M., Greenfield, Mass.
Chipman, Edward D., Unionville, Va.
Choate, John, Fitchburg, Mass.
Christiani, Charles, Washington, D.C.
Christiani, Theodore, Washington, D. C.
Christy, Robert, Mansfield, Pa.
Clark, Albert B., Jr., Galesburg, Ill.
Clark, John M., Milledgeville, Ga.
Close, George C., Brooklyn, N. Y.
Close, Eldridge W., New York.
Clough, Thomas R., Medford, Mass.
Cochran, Samuel W., Camden, N. J.
Cohen, Louis S., New York.
Colby, Frank A., Lancaster, N. H.
Colcord, Samuel M., Boston, Mass.
Cole, Theodore, New York.
Colgan, John, Louisville, Ky.
Collins, Charles F. G., Beloit, Wis.
Colton, James B , Boston, Mass.
Cone, John W., Providence, R. I.
Congdon, Albert J., East Greenwich, R I.
Conner, Jefferson S., New Albany, Ind.
Connor, L. Myers, Lewisville, Texas.
Conrad, William A. S., Richmond, Va.
Coombe, Thomas R., Philadelphia.
Cook, George E., Port Jervis, N. Y.
Cook, John G., Lewiston, Me.
Cook, Thomas E., Philadelphia.
Cornell, Edward A., Williamsport, Pa.
Cotting, William A., Milledgeville, Ga.
Cotton, William H., Newport, R. I.
Covell, Thomas J., Boston, Mass.
Cowdin, George H., Somerville, Mass.
Craig, John S., Boston, Mass.
Craighill, Edward A., Norfolk, Va.
Cramer, Henry, Philadelphia.
Crawford, William H., St. Louis, Mo.
Crawley, Francis X., St. Louis, Mo.
Cressler, Charles H., Chambersburg.
Creuse, Jules L. A., New York.
Cromwell, Zachariah W., Washington, D. C.
Crossman, George A., Brandon, Vt.
Cummings, Henry T., Portland, Me.
Cunningham, John M., Pottstown, Pa.
Currie, John H., New York.
Curtis, Lebbens, Searsport, Me.
Curtiss, Charles G., Brooklyn, N. Y.
Curtman, Charles O., St. Louis, Mo.
Cusack, Robert, Jersey City, N. J.
Cutler, Edward W., Boston, Mass.
Cutts, Foxwell C., Jr., Brooklyn, N.Y.
Daggett, Alfred, Jr., New Haven, Conn.
Daggett, Henry, New Haven, Conn.
Dalrymple, Charles H., Morristown, N. J.
Dame, S. P., Sharon, Mercer Co., Pa.
D'Amour, Otto, St. Louis, Mo.
Dana, Edmund, Jr., Portland, Me.
Daniels, John B., Atlanta, Ga.
Daniels, Samuel O., Natick, Mass.
Davidson, Frank A , Boston.
Davis, George W., Providence, R. I.
Davis, Benjamin, New York, N. Y.
Davis, Vincent, Louisville, Ky.
Dawson, Edward S., Jr., Syracuse, N.Y.
Day, Carlos E., Brooklyn, N. Y.
Day, Charles W., Champaign, Ill.
Day, Walter D., New City, N. Y.
Daycock, William H., Brooklyn, N Y.
Dearborn, George L., New Market, N. H.
Dege, George F., New York, N. Y.
De La Cour, Joseph L., Camden, N. J.
Delavallade, John M., Plaquemine, La.
Denham, Charles S., Rockland, Mass.
Dennin, Charles, Brooklyn, N. Y.
Devendorf, Almond S., Galesburg, Ill.
Diehl, C. Lewis, Louisville, Ky.
Dikeman, Nathan, Waterbury, Conn.
Dimock, Robert H., Waterbury, Conn.

Ditman, Andrew J., New York, N. Y.
Dobbins, Edward T., Philadelphia.
Dohme, Charles E., Baltimore, Md.
Dohme, Louis, Baltimore, Md.
Doliber, Thomas, Boston, Mass.
Donavin, Matthew W., Baltimore, Md.
Donnell, J. Woodbury, Richmond, Me.
Doolittle, Erastus H., Boston.
Dougherty, Samuel E., Jersey City, N. J.
Douglass, Henry, Jr., Brooklyn, N. Y.
Drake, Charles W., Middleboro, Mass.
Drake, John R., Milwaukee, Wis.
Drake, Jonathan B., Elizabeth, N. J.
Dreher, Ernest, Newark, N. J.
Drew, John W., Washington, D. C.
Drury, Linus D , Boston.
Dryer, James W., Indianapolis, Ind.
Duble, Jessie B., Williamsport, Pa.
Duckett, Walter G., Washington, D. C.
Dudley, Oscar E., Brooklyn, N. Y.
Dufour, Clarence R., Washington, D. C.
Dung, Albert C., New York, N. Y.
Dunk, Alfred A., East Saginaw, Mich.
Dunn, John A., Brooklyn, N. Y.
Dupuy, Eugene, Brooklyn, N. Y.
Dupuy, Powhatan E., Richmond, Va.
Dyson, Dunbar S., Bloomington, Ill.
Eareckson, Edwin, Baltimore, Md.
Eastman, Charles S., Concord, N. H.
Easton, Luther W., Rockland, Mass.
Eaton, Charles I., Boston, Mass.
Eberbach, Ottmar, Ann Arbor, Mich.
Ebert, Albert E., Chicago, Ill.
Eberle, Charles L., Philadelphia, Pa.
Eberle, Herman T., Watertown, Wis.
Eckel, Augustus W., Charleston, S. C.
Eddy, Henry C., Philadelphia, Pa.
Eger, George, Cincinnati, O.
Eggers, Frederick H., Allegheny City, Pa.
Eimer, Charles, New York, N. Y.
Elbe, C. B., Alameda, Cal.
Eldridge, George W., Philadelphia, Pa.
Elliot, William, Toronto, Can.
Elliott, Henry A., Baltimore, Md.
Ellis, Evan T., Philadelphia, Pa.
Emich, Columbus V., Baltimore, Md.
England, Robert, Philadelphia, Pa.
Entwisle, William B., Washington, D. C.
Erben, John S., Philadelphia, Pa.
Estes, Joseph J., Rockland, Mass.
Evans, Joseph S., West Chester, Pa.
Faber, John, New York, N. Y.
Fahlen, Julius, Memphis, Tenn.
Fairbanks, Harlan, Worcester, Mass.
Fairchild, Benjamin T., New York, N. Y.
Fale, John, Hawkinsville, Ga.
Featherston'h, Edward R., St. Louis, Mo.
Feemster, Joseph H., Cincinnati, O.
Fennel, Adolphus, Cincinnati, O.
Fenner, William R., Rome, Ga.
Ferguson, Robert B., Washington, D. C.
Ferree, Henry D., Springfield, Mass.
Ferris, Charles E., Lawrenceburg, Ind.
Fickardt, George H., Circleville, O.
Field, Amos, Macon, Mo.
Finlay, Norman J., Jersey City, N.J.
Finney, Thomas J., Harrisburg, Pa.
Fischer, Edward J., Buffalo, N. Y.
Fish, Charles F., Saratoga Springs, N. Y.
Fish, George H., Saratoga Springs, N. Y.
Fisher, William, New York, N. Y.
Flanagan, Lewis C., Somerville, Mass.
Flemmish, Doric B , New Orleans, La.
Flint, John H., Marysville, Cal.
Folger, William S., Boston, Mass.
Follansbee, Sherman, Boston, Mass.
Foltz, William K., Ashland, O.
Foertmyer, Adolphus W., Cincinnati, O.
Foster, Henry B , Concord, N. H.
Fougera, C. Edmund, New York, N. Y.
Fowle, Henry D., Boston, Mass.
Fox, Daniel S., Chicago, Ill.
Fox, Peter P., Philadelphia, Pa.
Frames, James P., Baltimore, Md.

Fraser, Edward A., New York, N. Y.
Fratz, John G., Cincinnati, O.
Fredigke, Charles C., Chicago, Ill.
French, George W., Boston, Mass.
Frey, John, New York, N. Y.
Frohwein, Richard, Elizabethport, N. J.
Frohwein, Theobald, New York, N. Y.
Frost, James, Vallejo, Solano Co., Cal.
Frost, John J., Lexington, Ky.
Frost, William A., Newport, R. I.
Frothingham, Edward G., Jr., Haverhill, Mass.
Früh, Carl D. S., Philadelphia, Pa.
Fuller, Henry W., Chicago, Ill.
Fuller, Oliver F., Chicago, Ill.
Fuller, Sumner H., Boston, Mass.
Gaillard, Edward, Philadelphia, Pa.
Gale, Edwin O., Chicago, Ill.
Gale, William H., Chicago, Ill.
Gallagher, Charles K., Washington, N. C.
Gallagher, James M., Washington, N. C.
Gardiner, Warren B., New York, N. Y.
Gardner, Robert W., New York, N. Y.
Garrigues, Samuel S., East Saginaw, Mich.
Garrison, Herod D., Chicago, Ill.
Gates, Amasa O., Morrisville, Vt.
Gates, Burt P., Saratoga, N. Y.
Gates, Carroll E., Saratoga, N. Y.
Gates, Howard E., Litchfield, Conn.
Gaylord, Henry C., Cleveland, O.
Geiger, Walter P., Canton, O.
Gellatly, William A., New York.
Genois, Louis, New Orleans, La.
George, Charles T., Harrisburg, Pa.
Gerhard, Samuel, Philadelphia, Pa.
Gibson, William A., Charleston, S.C.
Gill, George, Mount Vernon, N. Y.
Gilman, Samuel K., Boston, Mass.
Gilmore, John W., New York.
Girling, Robert N., New Orleans, La.
Gleeson, James A., Boston, Mass.
Gleeson, Michael H., Boston, Mass.
Glenn, Thomas S., St. Louis, Mo.
Godding, John G., Boston, Mass.
Good, James M., St. Louis, Mo.
Goodman, Charles F., Omaha, Neb.
Goodrich, Stephen, Hartford, Conn.
Goodwin, Lester H., Hartford, Conn.
Goodwyn, John W., Petersburg, Va.
Gordon, Edward B., Lynn, Mass.
Gordon, William J. M., Cincinnati, O.
Gossman, Adam J., Baltimore, Md.
Grahame Israel J., Philadelphia, Pa.
Graham, William A., Sandusky, O.
Grandjean, Charles, St. Louis, Mo.
Grandjean, Eugene, St. Louis, Mo.
Grant, William R., St. Louis, Mo.
Gray, Francis M., Hopkinsville, Ky.
Gray, Henry R., Montreal, Quebec, Canada.
Gray, William H., Springfield, Mass.
Green, Alexander A., Aurora, Nev.
Green, Thomas T., New York.
Greene, George E, Wyoming, R. I.
Gregory, Edmund, Lindsay, Ont., Can.
Greve, Theodore L. A., Cincinnati, O.
Gridley, Junius, New York.
Grieve, Fleming G., Milledgeville, Ga.
Griffith, Albert R., Oil City, Pa.
Griffith, Hiram E., Niagara Falls, N. Y.
Griffith, William H., New York.
Griswold, William H., North Adams, Mass.
Grossklaus, John F., Navarre, O.
Grove, John E., Philadelphia, O.
Guerdan, John, St. Louis, Mo.
Haas, George H., Rochester, N. Y.
Haddox, James B., Nashville, Tenn.
Hadley, Frank R., New Bedford, Mass.
Haenchen, Charles E., Philada., Pa.
Haight, William B., Stamford, Conn.
Hale, Frederick, New York City, N. Y.
Hall, Marshall C., Fredericksburg, Va.
Hall, Roland B., Macon, Ga.
Hance, Edward H., Philadelphia, Pa.
Hancock, Charles W., Philada., Pa.
Hancock, John F., Baltimore, Md.
Hancock, John H., New York.
Harbers, William H., Aiken, S. C.
Harlow, Noah S., Bangor, Me.

Harlow, Wickham N., Orange, N. J.
Harner, James M., New York, N. Y.
Harper, Frank M., Madison, Ind.
Harrington, Frank, Logan, O.
Harrop, Joseph, Leavenworth, Kan.
Hartness, William H., Cleveland, O.
Hartung, Hugo R., Wheeling, W. Va.
Harvey, Edmund, Toronto, Can.
Harwood, Frank L., Warren, Mass.
Harwood, Lucien, Warren, Mass.
Hassencamp, Ferdinand, Baltimore, Md.
Hatch, Frederick A., Boston, Mass.
Hatfield, Vermont, Middletown, O.
Havenstein, Alexander, Newark, N.J.
Haviland, Henry, New York.
Hawkins, M. Smith, Salem, Columbiana Co., O.
Hay, Henry H., Portland, Me.
Hays, David, New York City.
Hazlett, Edward E., Philada., Pa.
Hebberling, Gottfried, New York City.
Heimstreet, Edward B., Janesville, Wis.
Heinemann Otto, Cincinnati, Ohio.
Heinitsh, Charles A., Lancaster, Pa.
Heinitsh, Edward H., Columbia, S. C.
Heintzelman, Joseph A., Philada., Pa.
Heller, Peter H., Washington, D. C.
Helman, Charles M., Cincinnati, O.
Henchman, Daniel, Boston, Mass.
Henderson, John, Toronto, Can.
Henes, William F., New York.
Henrich, George, Mascoutah, Ill.
Hepburn, John, Flushing, N. Y.
Herbruger, Florence C., Panama, U. S of Colombia.
Heuerman, Henry W., Chicago, Ill.
Heydenreich, Emile, Brooklyn, N. Y.
Heydenreich, F. Victor, Brooklyn, N. Y.
Heyl, James B., Hamilton, Bermuda.
Heyser, William, Jr., Chambersburg, Pa.
Hickling, Daniel P., Washington, D.C.
Higgins, Albert W., Rutland, Vt.
Higgins, James S., New York.
Hildreth, Charles F. Allentown, N. H.
Hill, Alfred C., Cincinnati, O.
Hinsdale, Samuel J., Fayetteville, N. C.
Hitchcock, William E., Newark, N. J.
Hoagland, Pratt R , Boston, Mass.
Hodge, Charles, Portland, Oregon.
Hodgetts, George, Toronto, Can.
Hoerner, Theodore, Memphis, Tenn.
Hoffmann, Frederick, New York.
Hogan, Louis C., Chicago, Ill.
Hohenthal, Charles F. L., New York.
Hohly, Charles, Toledo, O.
Holden, Henry C., Clinton, Mass.
Holland, Samuel P., Pittsburg, Pa.
Holmes, Clay W., Wilkesbarre, Pa.
Holt, Alvin E., Detroit, Mich.
Holzhauer, Charles, Newark, N. J.
Hood, Charles I., Lowell, Mass.
Hooper, John H., Chicago, Ill.
Hopp, Lewis C., Cleveland, O.
Horn, Wilbur F., Carlisle, Pa.
Hornton, William F., Boston, Mass.
Hostetter, Charles M., Pittsburg, Pa.
Hottendorf, Augustus, Cincinnati, O.
Howard, Daniel H., Medford, Mass.
Howarth, James L., Jacksonville, Fla.
Howarth, John W., Utica, N. Y.
Howson, Walter H., Chillicothe, O.
Hoyt, George M., Boston, Mass.
Hubbard, John H., Cambridge, Mass.
Huddart, John F., Louisville, Ky.
Hudnut, Alexander, New York.
Huling, Bruce, Cleveland, O.
Hunt, James L , Hingham, Mass.
Hurst, John C., Philadelphia, Pa.
Huston, Charles, Columbus, O.
Hyler, William H., Port Chester, N. Y.
Imhof, Henry, New York.
Ingalls, John, Macon, Ga.
Ink, Parker P., Washington, Iowa.
Jackson, Vincent R., Baltimore, Md.
Jacobus, Judson S., Chicago, Ill.
Jacques, George W., South Amboy, N. J.
Jaggar, Charles H., Nantucket, Mass.
James, George R., Schoolcraft, Mich.
James, Thomas P., Cambridge, Mass.

Jamieson, Thomas N., Chicago, Ill.
Jarrett, Henry T., New York.
Jauncey, William, Chicago, Ill.
Jefferson, John H. B., Baltimore, Md.
Jefferson, William E., Fredericktown, O.
Jenkins, Luther L., Boston, Mass.
Jenks, Thomas L., Boston, Mass.
Jenks, William J., Philadelphia, Pa.
Jennings, N. Hynson, Baltimore, Md.
Jesson, Jacob, Chippewa Falls, Wis.
Johnson, Benjamin F., Philada., Pa.
Johnson, Charles B., Middletown, O.
Johnson, Edward L., New York.
Johnston, William, Detroit, Mich.
Jones, Alexander H., Philada., Pa.
Jones, Charles K., St. Louis, Mo.
Jones, Charles M., Somersworth, N. H.
Jones, Daniel S., Philadelphia, Pa.
Jones, Edward C., Philadelphia, Pa.
Jones, James T., Boston, Mass.
Jones, Simon N., Louisville, Ky.
Jones, Thomas, Brooklyn, N. Y.
Jordan, Francis, Goderich, Can.
Jordan, William H., Portland, Me.
Judge, John F., Cincinnati, O.
Kalb, Theodore, St. Louis, Mo.
Kalish, Julius, New York, N. Y.
Karch, Joseph L., Lebanon, Pa.
Karrmann, William, Cincinnati, O.
Kay, Isaac H., Philadelphia, Pa.
Keasby, Henry G., Philadelphia, Pa.
Keeler, William H., Saginaw City, Mich.
Keeney, Caleb R., Philadelphia, Pa.
Keeshan, John, Cincinnati, O.
Keffer, William P., New Orleans, La.
Kelley, Edward S., Boston, Mass.
Kelsey, Henry J., New Haven, Conn.
Kennedy, George W., Pottsville, Pa.
Kent, Robert R., Boston, Mass.
Kerr, James, Jr., Pittsburg, Pa.
Kettell, George P., Charlestown, Mass.
Keys, Roger, Philadelphia, Pa.
Kidder, Samuel, Jr., Lowell, Mass.
Kidwell, John L., Washington, D. C.
Kielhorn, Henry, Indianapolis, Ind.
Kiersted, Henry T., New York.
Kimmel, Henry, New York.
King, James T., Middletown, N. Y.
Kirkbride, Joseph C., St. Louis, Mo.
Kitchen, Charles W., Brooklyn, N. Y.
Kline, Mahlon N., Philadelphia, Pa.
Klussmann, Hermann, Hoboken, N. J.
Knabe, Gust. A , Washington, D. C.
Knowles, Henry A., Toronto, Can.
Knowlson, Alexander M., Troy, N. Y.
Koch, Louis, Philadelphia, Pa.
Koehnken, Herman H., Cincinnati, O.
Kolp, C. Henry, Philadelphia, Pa.
Krebs, Hugo, St. Louis, Mo.
Krehbiel, Gustavus, New York City, N. Y.
Krewson, William E., Philada., Pa.
Krieger, Philip, Brooklyn, N. Y.
Krusemarck, Charles, Chicago, Ill.
Krummeck, Jacob, Santa Fé, New Mexico.
Laird, William R., Jersey City, N. J.
Lambe, John J., Hartford, Conn.
Lamberton, John F., Saratoga Springs, N. Y.
Land, Robert H., Augusta, Ga.
Lander, John C., Toronto, Can.
Lane, Alfred S., Rochester, N. Y.
Langebecker, Charles O., Gretna, La.
Larwill, Jos H., Jr., Bolivar, Tenn.
Latimer, Robert F., Westerley, R. I.
Lauer, Michael J., Baltimore, Md.
Laurent, Eugene L., Nashville, Tenn.
Lautenbach, Robert, Baltimore, Md.
Lawlor, Charles J., Brooklyn, N. Y.
Lawton, Charles H., New Bedford, Mass.
Lawton, Horace A., New Bedford, Mass.
Laycock, Washington, Rondout, N. Y.
Lazell, Lewis T., New York City.
Leary, Jeremiah T., Boston, Mass.
Lee, Addison S., Raleigh, N. C.
Lee, Emmor H., Camden, N. J.
Lee, James A., New Iberia, La.
Lehlbach, Paul F., New York.
Lehn, Louis, New York.
Leis, George, Lawrence, Kan.
Leitch, Arthur, St. Louis, Mo.

Lemberger, Joseph L., Lebanon, Pa.
Levering, P. Wharton, Jersey City, N. J.
Levy, Adolph, Brooklyn, N. Y.
Lewis, Elam C., Rutland, Vt.
Lewis, Samuel E., Washington, D. C.
Lewis, Thomas, Brooklyn, N. Y.
Lillie, Chas., Great Barrington, Mass.
Lilly, Alonzo, Jr., Baltimore, Md.
Lincoln, Henry W., Boston, Mass.
Lindewald, Wilhelm E , Philada., Pa.
Lingelbach, Ferd., Louisville, Ky.
Lippincott, Henry B., Philada, Pa.
Littell, William M., Newark, N. J.
Littlefield, Alvah, Boston, Mass.
Livingston, Borent V. B., Brooklyn, N. Y.
Llewellyn, John F., Mexico, Adrian County, Mo.
Lloyd, John U., Cincinnati, O.
Lobstein, J. F. Daniel, Sag Harbor, N. Y.
Loomis, John C., Jeffersonville, Ind.
Lowd, John C., Boston, Mass.
Lowden, John, Montreal, Can
Luckenback, Edward H., Bethlehem, Pa.
Ludlow, Charles, Springfield, O.
Luhn, Gustavus J., Charleston, S. C.
Lumsden, Chas. H., Lynchburg, Va.
Lunt, Samuel H., Alexandria, Va.
Lutz, Harrison S., Allegheny City, Pa.
Lyman, Benjamin, Montreal, Quebec, Can.
Lyman, Stephen J., Montreal, Quebec, Can.
Lyons, Isaac L., New Orleans, La.
McAfee, James A., Louisville, Ky.
McCarty, William, Morristown, N. J.
McConville, Thomas A., Worcester, Mass.
McDougall, James, Port Jervis, N. Y.
McElhenie, Thomas D., Brooklyn, N. Y.
McInall, Edward, Jr., Wilmington, Del.
McIntyre, Byron F., New York.
McIntyre, Ewen, New York.
McIntyre, William, Philadelphia, Pa.
McKay, George J., Eureka, Humboldt Bay, Cal.
McKelway, George I., Philada., Pa.
McKesson, John, Jr., New York.
McPherson, George, Chicago, Ill.
MacDonald, George, Kalamazoo, Mich.
Macmahon, Thomas J., New York.
Magill, Benjamin M., Philada., Pa.
Mahla, Frederick, Chicago, Ill.
Main, Thomas F., New Britain, Conn.
Maisch, John M., Philadelphia, Pa.
Major, John R., Washington, D. C.
Mallinckrodt, Edward, St. Louis, Mo.
Mangold, George A., New York.
Markoe, George F. H., Boston, Mass.
Markward, James, Cincinnati, O.
Marsh, Edward H., New York.
Marshall, Ernest C., Charlestown, Mass.
Marshall, Hubert J , Aurora, Ind.
Marvel, Amos F., Taunton, Mass.
Marvin, Thomas E. O., Portsmouth, N. H.
Masi, Frederick H., Norfolk, Va.
Mason, Norman N., Providence, R. I.
Massey, George, Toronto, Ont., Can.
Mattern, William K., Philada., Pa.
Mattison, Richard V., Philada., Pa.
May, James O., Naugatuck, Conn.
Mayell, Alfred, Cleveland, O.
Meade, Richard H., Richmond, Va.
Melchers, Henry, East Saginaw, Mich.
Mellor, Alfred, Philadelphia, Pa.
Menard, Alexander A., Macon, Ga.
Melvin, James S., Boston, Mass.
Menninger, Henry J., Brooklyn, N. Y.
Mercein, James R., Jersey City, N. J.
Merrell, William S., Cincinnati, O.
Merrick, John M., Boston, Mass.
Merrill, Charles A., Exeter, N. H.
Merrill, Walter S., Danvers, Mass.
Metcalf, Theodore, Boston, Mass.
Meyer, Christian F. G., St. Louis, Mo.
Meyers, Edward T., Bethlehem, Pa.
Meyers, James A., Columbia, Pa.
Michaelis, Charles O., Charleston, S. C.
Milburn, John A , Washington, D. C.

Milhau, Edward L., New York.
Mill, James W., Chicago, Ill.
Milleman, Philip, Chicago, Ill.
Millener, William T., Spencerport, N. Y.
Miller, Adolph W., Philada., Pa.
Miller, Frederick C., Louisville, Ky.
Miller, George Y., Luzerne, Warren Co., N. Y.
Miller, Jacob A., Harrisburg, Pa.
Miller, Louis, Mount Holly, N. J.
Miller, Polk, Richmond, Va.
Milligan, Decatur, Philadelphia, Pa.
Mills, Andrew M., Newark, N. J.
Mingay, James, Saratoga Springs, N. Y.
Mitchell, Bossom A., London, Ont.
Mitchell, Charles L., Philadelphia, Pa.
Mitnach, Henry, Baltimore, Md.
Miville, Francis C., Manchester, N. H.
Mobley, Cyrus L., Louisville, Ky.
Moffitt, Thomas S., San Francisco, Cal
Mohr, Charles, Mobile, Ala.
Moise, Benjamin F., Charleston, S. C.
Moith, Augustus T., Fishkill, N. Y.
Moll, William, Saginaw City, Mich.
Molwitz, Ernest, New York.
Monsarrat, Oscar, Baltimore, Md.
Moody, Richard H., Belfast, Me.
Moore, George, Somersworth, N. H.
Moore, J. Faris, Baltimore, Md.
Moore, James P., Cleveland, O.
Moore, Joachim B., Philada., Pa.
Moorhead, William W., Philadelphia, Pa.
Morgan, Benjamin G., Hyde Park, Pa.
Morgan, James, Ypsilanti, Mich.
Morgan, Richard E., Great Barrington, Mass.
Morley, William J., Austin, Tex.
Morrill, Benjamin, Littleton, N. H.
Morrison, Samuel C., Stamford, Conn.
Morrison, S. Ellwood, Baltimore, Md.
Morrison, Thomas O., New York.
Morse, Frank A., West Rutland, Vt.
Mortimer, William G, New York.
Mueller, Adolphus, Highland, Ill.
Munson, Luzerne J., Waterbury, Conn.
Murray, Francis M., Philadelphia.
Muth, John P., Baltimore, Md.
Needles, Caleb H., Philadelphia, Pa.
Neergaard, William, New York.
Newbold, Thomas M., Philada., Pa.
Newman, George A., Louisville, Ky.
Newman, George A., Brooklyn, N. Y.
Nesbitt, Charles A., Richmond, Va.
Nichols, Edward P., Newark, N. J.
Nichols, Thomas B., Salem, Mass.
Nick, William F., Jr., Erie, Pa.
Nicot, Lewis E., Brooklyn, N. Y.
Niebrugge, John A., Brooklyn, N. Y.
Nietsch, Adolph J. W., Brooklyn, N. Y.
Noble, John J., Newton Centre, Mass.
Nodler, Peter, Covington, Ky.
Nolting, Adolphus W., Jr., Richmond, Va.
Nowell, William F., Boston, Mass.
Noyes, Parker J., Lancaster, N. H.
Oatman, Le Roy S., Angola, Erie County, N. Y.
O'Brien, James J., Boston, Mass.
O'Donnel, James D., Washington, D. C.
O'Gallagher, James, St. Louis, Mo.
Ohliger, Lewis P., Wooster, O.
Oldberg, Oscar, Washington, D. C.
Oleson, Olaf M., Fort Dodge, Ia.
Oliver, William M., Elizabeth, N. J.
Ollif, James H., Brooklyn, N. Y.
Orne, Charles P., Cambridgeport, Mass.
Orne, Joel S., Cambridgeport, Mass.
Orynski, Leonardo, Hannibal, Mo.
Osborne, Hampden, Columbus, Miss.
Osburn, William H., Baltimore, Md.
Osgood, Hugh H., Norwich, Conn.
Osmun, Charles A., New York, N. Y.
Ottinger, Franklin, Pittsburg, Pa.
Ottinger, James J., Philadelphia, Pa.
Owens, Richard J., Brooklyn, N. Y.
Paine, James D., Rochester, N. Y.
Paine, Milton K., Windsor, Vt.
Painter, Emlen, San Francisco, Cal.
Palmer, Hosea W., Chicago, Ill.
Palmer, John D., Monticello, Florida.
Parcher, George A., Ellsworth, Me.
Parker George H., Andover, Mass.

Parker, Joseph L , Boston, Mass.
Parr, John C., Weston, Mo.
Parrish, Clemmons, Philadelphia, Pa.
Parrish, Dillwyn, Philadelphia, Pa.
Parsons, John, Chicago, Ill.
Parsons, Robert E., Orange, N. J.
Partridge, Charles K., Augusta, Me.
Patch, Edgar L., Boston, Mass.
Patten, I. Bartlett, Boston, Mass.
Patten, John F., Bangor, Me.
Patterson, James L., Philada., Pa.
Patterson, Theodore H , Chicago, Ill.
Patton, William A., Catlettsburg, Ky.
Pauknin, Charles F., Charleston, S. C.
Pauly, Christian, Jersey City, N. J.
Peabody, William H., Buffalo, N. Y
Peacock, Frederick S., Atlanta, Ga.
Peduzzi, George S., Brooklyn, N. Y.
Peirpoint, Newton, Englewood, Cook County, Ill.
Peixotto, Moses L. M., New York, N. Y.
Pennington, T. H. Sands, Saratoga, N. Y.
Penrose, Stephen F., Quakertown, Pa.
Perkins, Elisha H., Baltimore, Md.
Perkins, William A., Virginia City, Nev.
Perot, T. Morris, Philadelphia, Pa.
Perry, Bayard T., Manchester, N. H.
Perry, Frank V., Danbury, Conn.
Peters, Alexander C., Newark, N. J.
Petrie, Alexander B., Guelph, Ont., Can.
Pfeiffer, Adolph, St. Louis, Mo.
Pfingst, Edward C., Louisville, Ky.
Pfingst, Ferdinand J., Louisville, Ky.
Pfingst, Henry A., Louisville, Ky.
Pfingsten, Gustavus, New York, N. Y.
Phelps, Dwight, West Winsted, Conn.
Phillips, George W. C., Jersey City, N. J.
Phillips, Walter F., Portland, Me.
Phipps, John M., Monson, Mass.
Physick, Henry S., St. Louis, Mo.
Pickford, Thomas, Wallingford, Conn.
Pile, Wilson H., Philadelphia, Pa.
Pinkham, Alonzo T., Dover, N. H.
Pitt, John R., Jr., Middletown, Conn
Plaisted, James H , Waterville, Me.
Plummer, David G., Bradford, Stark County, Ill.
Plummer, George B., Hinsdale, Mass.
Post, Elisha, Philadelphia, Pa.
Potts, Jesse N., Baltimore, Md.
Power, Frederick B , Philada., Pa.
Powell, Thos W., Fort Worth, Texas.
Prentice, Fred. F., Kenosha, Wis.
Prescott, Albert B., Ann Arbor, Mich.
Prescott, Horace A., Dorchester, Mass.
Preston, Alfred, Jr., Portland, Me.
Preston, David, Philadelphia, Pa.
Price, Charles S., Washington, D. C.
Primm, Hubert, St. Louis, Mo.
Procter, Wallace, Philadelphia, Pa.
Proctor, Benjamin, Lynn, Mass.
Pugh, Finley B., Rushville, Ind.
Punch, William F , Mobile, Ala.
Purcell, John B., Richmond, Va.
Pyle, Cyrus, Brooklyn, N. Y.
Raas, Francis, Brooklyn, N. Y.
Rackley, Benjamin F., Dover, N. H.
Ramsperger, Gustavus, New York.
Randall, George D., St. Johnsbury, Vt.
Rankin, Jesse W., Atlanta, Ga.
Rano, Charles O., Buffalo, N. Y.
Rapelye, Charles A., Hartford, Conn.
Raser, John B., Reading, Pa.
Redfearn, John, Fall River, Mass.
Reichardt, F. Alfred, New York.
Reinhold, William, Chicago, Ill.
Reinlein, Paul, Washington, D. C.
Remington, Joseph P., Philada., Pa.
Rendigs, Charles P., Cincinnati, O.
Renouff, James T., Winsted, Conn.
Restieaux, Thomas, Boston, Mass.
Reum, Hermann F., Cincinnati, O.
Reynolds, Howard P., Plainfield, N. J.
Reynolds, John J., Louisville, Ky.
Reynolds, William K., Providence, R. I.
Rhoades, Stephen H., Pittston, Pa.
Rice, Charles, New York.
Rice, J. Allen, Milford, Mass.
Richardson, J. Clifford, St. Louis, Mo.

Richardson, Marius D., Lexington, Ky.
Ricker, George D., Boston, Mass.
Rickey, Randal, Trenton, N. J.
Ricksecker, Theodore, New York.
Rideout, James W., Brooklyn, N. Y.
Riley, Charles W., Philadelphia, Pa.
Ritson, Alfred, Columbus, O.
Rittenhouse, Henry N., Philada., Pa.
Robbins, Alonzo, Philadelphia, Pa.
Robbins, Charles A., New York.
Robbins, Daniel C., New York.
Roberts, Joseph, Baltimore, Md.
Robinson, James S., Memphis, Tenn.
Robinson, William S., Toronto, Can.
Roche, Edward M., Philada , Pa.
Roche, William F., Philada., Pa.
Rogers, Wiley, Louisville, Ky.
Rogers, William H., Middletown, N. Y.
Rohrbach, Theodore, Cumberland, Md.
Rollins, John F., Fort George, Fla.
Ronnefeld, Theodore, Detroit, Mich.
Rose, Henry J., Toronto, Ont., Can.
Rosengarten, Mitchell G., Phila., Pa.
Royce, Lucien M., New York.
Ruete, Theodore W., Dubuque, Iowa.
Rumsey, Samuel L., East Orange, N. J.
Runyon, Edward W., New York.
Russell, Edward W., Baltimore, Md.
Russell, Elias S., Nashua, N. H.
Russell, Eugene J., Baltimore, Md.
Rust, William, New Brunswick, N, J.
Sackett, Samuel M., Monroe, Mich.
Safford, William B., Memphis, Tenn.
Sander, Enno, St. Louis, Mo.
Sands, George G., New York.
Sappington, Richard, Baltimore, Md.
Sargent, Ezekiel H., Chicago, Ill.
Saunders, Richard B., Chapel Hill, N. C.
Saunders, William, London, Ont., Can.
Sayre, Edward A., Brooklyn, N. Y.
Sayre, William H., Newark, N. J.
Scala, William F., Washington, D. C.
Scattergood, George J., Philada., Pa.
Schaaf, Justus H., Vidalia, La.
Schaefer, George H., Fort Madison Iowa.
Schaffle, Samuel W. W., Lewisburg, Pa.
Schafhirt, Adolph J., Washington, D. C.
Scheffer, Emil, Louisville, Ky.
Scheffer, Henry W., St. Louis, Mo.
Scherff, John P., Bloomfield, N. J.
Scholz, Philip, St. Louis, Mo.
Schrader, Henry, Indianapolis, Ind.
Schranck, Henry C., Milwaukee, Wis.
Schreiber, August, Tell City, Ind.
Schroder, Hermann, Quincy, Ill.
Schumann, Theodore, Atlanta, Ga.
Schwab, Louis, Cincinnati, O.
Scofield, James S., New York.
Scott, Albert A., Richmond, Va.
Scott, David, Worcester, Mass.
Scott, Nelson R., Worcester, Mass.
Scott, William H., Richmond, Va.
Scott, William J., Cleveland, O.
Scribner, Benjamin F., New Albany, Ind.
Seabury, George J., New York.
Sears, George T., Boston, Mass.
Seaward, Daniel W., New York.
Selfridge, Matthew M., Philada., Pa.
Senier, Frederick S., Maxomanie, Wis.
Sennewald, Ferdinand W., St. Louis, Mo.
Sevin, N. Douglass, Norwich, Conn.
Sewall, David J., Boston, Mass.
Sharp, Alpheus P., Baltimore, Md.
Sharp, Joseph P., Chicago, Ill.
Sharples, Stephen P., Boston, Mass.
Shaw, Louis, Philadelphia, Pa.
Shaw, Robert J., Plainfield, N. J.
Shaw, Stephen F., Rochester, N. H.
Shead, Edward E., Eastport, Me.
Shedden, John W., New York.
Sheils, George E., New York.
Sheppard, Samuel A. D , Boston, Mass.
Sherman, Linus E., Ludlow, Vt.
Sherman, Oliver G., Jersey City, N. J.
Sherwood, Hezekiah S., Poughkeepsie, N. Y.

Shinn, James T., Philadelphia, Pa.
Shivers, Charles, Philadelphia, Pa.
Shoemaker, Benjamin, Wilmington, Del
Shoemaker, Joseph L., Philada., Pa.
Shoemaker, Richard M., Philada., Pa.
Shriver, Henry, Cumberland, Md.
Shryer, Thomas W., Cumberland, Md.
Shryock, Allen, Philadelphia, Pa.
Shurtleff, Israel H., New Bedford, Mass.
Shuttleworth, Edward B., Toronto, Ont., Can.
Simms, Giles G. C., Washington, D. C.
Simpers, J. Wilmer, Philada., Pa.
Simpson, William, Raleigh, N. C.
Simpson, William, San Francisco, Cal.
Simson, Francis C., Boston, Mass.
Singer, Peter J., Peoria, Ill.
Skelly, James J., New York.
Sliter, Albert H., Troy, N. Y.
Sloan, George W., Indianapolis, Ind.
Smalley, Elijah, Boston, Mass.
Smith, Albert C., Boston, Mass.
Smith, Charles B., Newark, N. J.
Smith, Charles G , Springfield, O.
Smith, Israel P., Newark, N. J.
Smith, Linton, Wilmington, Del.
Smith, Thomas C., Charlotte, N. C.
Smith, Warren, Chicopee, Mass.
Snow, Charles W., Syracuse, N. Y.
Snow, Jesse W., Boston, Mass.
Snowdon, George M., Philada., Pa.
Snyder, Alva L., Bryan, O.
Snyder, Ambrose C., Brooklyn, N. Y.
Somers, Frank G., Detroit, Mich.
Sommers, Richard M., Camden, N. J.
Souder, Joseph A., Camden, N. J.
Spalding, Warren A., New Haven, Conn.
Spannagel, Charles C., Philada., Pa.
Spenzer, Peter I., Cleveland, O.
Squibb, Edward R., Brooklyn, N. Y.
Squires, Charles P., Burlington, Iowa.
Stabler, Richard H., Alexandria, Va.
Stacey, Benjamin F., Charlestown, Mass.
Stamford, William H., Newark, N. J.
Starr, Thomas, New York.
Steele, Henry, San Francisco, Cal.
Steele, James G., San Francisco, Cal.
Steever, Henry C., Memphis, Tenn.
Stein, Jacob H., Reading, Pa.
Stephens, William G., Yonkers, N. Y.
Stoddard, George H., Boston, Mass.
Stout, William A., Springfield, O.
Stowell, David, Boston, Mass.
Strassel, William, Louisville, Ky.
Strehl, Louis C., Chicago, Ill.
Streit, Alexander G. F., Okawville, Washington County, Ill.
Strother, William A., Lynchburg, Va.
Sutton, Ellsworth S., Louisville, Ky.
Sutton, Peter P., Louisville, Ky.
Sweeney, Robert O., St. Paul, Min.
Sweet, Henry, Chicago, Ill.
Sylvester, Samuel R., Baltimore, Md.
Taber, Edward M., Washington, D.C.
Talbot, James S., Boston, Mass.
Taliaferro, Edwin C., Richmond, Va.
Tarrant, Homer P., Augusta, Ga.
Tartis, Alfred J., Brooklyn, N. Y.
Taylor, Alfred B., Philadelphia, Pa.
Taylor, Henry B., Philadelphia, Pa.
Taylor, James H., Newport, R. I.
Taylor, John P., New Bedford, Mass.
Taylor, Walter A., Atlanta, Ga.
Taylor, William A. S., Norfolk, Va.
Test, Alfred W., Camden, N. J.
Thatcher, Joseph H., Portsmouth, N. H.
Thatcher, Hervey D., Potsdam, N. Y.
Thayer, Henry, Cambridgeport, Mass.
Thibodeaux, Jos. G., Thibodeaux, La.
Thienemann, Charles, Baltimore, Md.
Thomas, James, Jr., Nashville, Tenn.
Thomsen, John J., Baltimore, Md.
Thompson, Thomas C., New Orleans, La.
Thompson, William B., Philada., Pa.
Thompson, William P., Baltimore, Md.
Thompson, William S., Washington, D. C.
Thompson, William S., Baltimore, Md.
Tiarks, Hermann, Monticello, Iowa.
Tibbs, William H., Buffalo, N. Y.

Tilden, Henry A., New Lebanon, N. Y.
Tilge, Frederick A., Philadelphia, Pa.
Tilyard, Charles S., Baltimore, Md.
Tompkins, Orlando, Boston, Mass.
Topley, James, Vallejo, Solano County, Cal.
Toplis, Robert J., Yonkers, N. Y.
Torrey, Chas. Edward, Norwich, N. Y.
Tower, Levi, Jr., Boston, Mass.
Townley, William W., Newark, N. J.
Tozzer, Samuel C., Lynn, Mass.
Trask, Charles M., Boston, Mass.
Trimble, Henry, Philadelphia, Pa.
Troth, Samuel F., Philadelphia, Pa.
Tscheppe, Adolph, New York.
Turner, Thomas L., Boston, Mass.
Tufts, Charles A., Dover, N. H.
Tyson, Samuel E., Washington, D. C.
Ubert, Julius C., Brooklyn, N. Y.
Ude, George, St. Louis, Mo.
Underhill, Charles F., Norfolk, Va.
Underhill, George F., Concord, N. H.
Underwood, Charles G., Boston, Mass.
Vandegrift, John A., Burlington, N. J.
Vandervoord, Ransford W., Newark, N. J.
Van Gieson, Theron W., Newark, N. J.
Van Patten, William J., Burlington, Vt.
Van Winkle, Abraham W., Newark, N. J.
Vaupel, Charles P., Cleveland, O.
Vernor, James, Detroit, Mich.
Viallon, Paul L., Bayou Goula, La.
Vickery, William H., Dover, N. H.
Vincent, William, Brooklyn, N. Y.
Vogelbach, Herman A., Philada., Pa.
Vogeler, Adolf G., Chicago, Ill.
Voorhees, Wm. H., Plainfield, N. J.
Vordick, August H., St. Louis, Mo.
Wagener, Samuel H., San Jose, Cal.
Wagner, Henry, Cincinnati, O.
Wagner, Louis, Richmond, Va.
Wakefield, Seth D., Lewiston, Me.
Walker, John A., Caledonia, Ont., Can.
Wangler, Conrad D., Cincinnati, O.
Wanier, George S., New York.
Wardell, Robert C., Battle Creek, Mich.
Warner, William R., Philadelphia, Pa.
Warren, George W., Boston, Mass.
Warrington, Charles W., Moorestown, N. J.
Waugh, George J., Stratford, Ont., Can.
Wayne, Edward S., Cincinnati, O.
Weaver, J. Thornton, Philada., Pa.
Weaver, James, New York.
Weaver, John A., Easton, Pa.
Webb, John A., Baltimore, Md.
Webb, Henry E , West Farms, N. Y.
Webb, William H., Philadelphia, Pa.
Webber, Joseph T., Springfield, Mass.
Weber, William, Philadelphia, Pa.
Webster, Stephen, Boston, Mass.
Weidemann, Charles A., Phila., Pa.
Weinman, Oscar C., New York.
Weismann, Augustus W., New York.
Wellcome, Henry S., New York.
Wells, Chas. C., Northampton, Mass.
Wells, Jacob D., Cincinnati, O.
Wells, John C., Hartford, Conn.
Wenck, George J., New York.
Wendel, Henry E., Philadelphia, Pa.
Wendler, Robert, Brooklyn, N. Y.
Wenzell, William T., San Francisco, Cal.
Westerfield, Joseph H., New York.
Whall, Joseph S., Quincy, Mass.
Wharton, John C., Nashville, Tenn.
Wharton, Wm. H., Nashville, Tenn.
Wheeler, C. Gilbert, Chicago, Ill.
Wheeler, Lucian F., Waldo, Fla.
White, Aaron S., Mt. Holly, N. J.
White, George H., Jersey City, N. J.
White, Philip A., New York.
Whitfield, Thomas, Chicago, Ill.
Whiting, Frederick T., Great Barrington, Mass.
Whitman, Nelson S., Nashua, N. H.
Whitney, Henry M., Lawrence, Mass.
Wickham, William H., New York.
Wiegand, Thomas S., Philada., Pa.
Wienges, Conrad, Jersey City, N. J.
Wigert, Carl R., Burlington, Iowa.
Wike, Albert D., Marietta, Pa.

Wild, Joseph O., Holyoke, Mass.
Wilder, Frederick W., Ware, Mass.
Wilder, Graham, Louisville, Ky.
Wilder, Hans M., Philadelphia, Pa.
Wilkins, Daniel G., Boston, Mass.
Willard, Joseph, Chicago, Ill.
Willard, William H., Worcester, Mass.
Williams, John K., Hartford, Conn.
Williams, Joseph, London, Ont., Can.
Williamson, Edward J., St. Louis, Mo.
Willis, Joseph N., Richmond, Va.
Wilson, Adam H, Philadelphia, Pa.
Wilson, Benjamin O., Boston, Mass.
Wilson, Julius H., Chicago, Ill.
Wilson, William, New York.
Wingate, Jeremiah Y., Somersworth, N. H.
Winkleman, John H., Baltimore, Md.
Winslow, Samuel W., Boston, Mass.
Winter, Jonas, Hagerstown, Md.
Witte, L. Edward, St. Louis, Mo.
Woltersdorf, Louis, Chicago, Ill.
Wood, Alonzo F., New Haven, Conn.
Woodbridge, George W., Boston, Mass.
Woodruff, Roderick S., Waterbury, Conn.
Woodward, Samuel M., Baltimore, Md.
Worthington, J. Willits, Moorestown, N. J.
Wright, Archibald W., Philada., Pa.
Wright, William P., Boston, Mass.
Wright, William, Jr., Fort Wayne, Ind.
Wynn, William, Brooklyn, N. Y.
Yeomans, Lewis W., Belleville, Ont., Can.
Yorston, Matthew M., Cincinnati, O.
Young, Alexander S., Wheeling, W. Va.
Young, John E., Vergennes, Vt.
Zeilin, John H., Philadelphia, Pa.
Zellhoefer, George, New York.
Ziegler, Philip M., Reading, Pa.
Zwick, George G., Covington, Ky.

LIST OF DECEASED MEMBERS.

HONORARY MEMBERS.

		Elected.	Died.
Bache, Franklin, M.D.,	Philadelphia, Pa.,	1857	1864
Bailey, Montgomery J., M D.,	New York,	1856	1873
Boullay, Pierre François Guillaume,	Paris, France,	1868	1869
Casselmann, Arthur, Ph.D.,	St Petersburg, Russia,	1868	1872
Deane, Henry,	London, England,	1868	1874
Durand, Elias,	Philadelphia, Pa.,	1857	1873
Farrington, Thomas,	Boston, Mass.,	1856	1867
Hanbury, Daniel,	London, England,	1868	1875
Ludwig, Hermann, Ph.D.,	Jena, Germany,	1871	1873
Robinet, Stephane,	Paris, France,	1868	1869

ACTIVE MEMBERS.

		Elected.	Died.
Aimar, George Washington,	Charleston, S. C.,	1874	1877
Anderson, James H.,	New York,	1859	1866
Andrews, George W. (Pres. 1856–57),	Baltimore, Md.,	1856	1877
Aspinwall, James S.,	New York,	1855	1874
Atwood, Charles Henry,	Boston, Mass.,	1856	1877
Bache, Charles L.,	San Francisco, Cal.,	1852	1854
Backus, James W.,	Marine City, Mich.,	1867	1870
Badger, Charles W.,	Newark, N. J.,	1870	1877
Balmer, James,	Baltimore, Md.,	1856	1866
Barry, John W.,	Baltimore, Md.,	1856	1861
Baylis, William E. P.,	Brooklyn, N. Y.,	1860	1872
Baynon, John,	Shreveport, La.,	1858	1862
Benzinger, John Sylvester,	Baltimore, Md.,	1860	1869
Bertolett, William J ,	Shreve, O.,	1872	1877
Bidwell, Marshall Spring,	Elmira, N. Y.,	1871	1877
Bigelow, Francis O.,	Medford, Mass.,	1859	1863
Billings, Samuel J.,	New York,	1860	1865
Bingham, John C.,	St. Johnsbury, Vt.,	1853	1870
Blair, Henry C.,	Philadelphia, Pa.,	1855	1862
Blauw, Hippolyt A.,	Rochester, N. Y.,	1856	1870

		Elected.	Died.
Bowman, Henry K.,	Philadelphia, Pa.,	1869	1873
Boyden, Ashel,	Boston, Mass.,	1853	1877
Bright, James Evesson,	Worcester, Mass.,	1868	1872
Bringhurst, Ferris,	Wilmington, Del.,	1862	1871
Brown, John T.,	Boston, Mass.,	1859	1860
Brown, William,	Boston, Mass.,	1858	1875
Canavan, Benjamin,	New York, N. Y.,	1855	1857
Carney, Charles Tibbetts,	Boston, Mass.,	1853	1862
Caspari, Charles,	Baltimore, Md.,	1856	1870
Chapman, William B. (Pres. 1854–55),	Cincinnati, O.,	1852	1874
Churchill, George W.,	Chelsea, Mass.,	1865	1869
Cleney, William F.,	Cincinnati, O.,	1859	1865
Coddington, Isaac,	New York, N. Y.,	1855	1874
Colby, Moses D.,	Boston, Mass.,	1859	1870
Coon, Walter S.,	New York, N. Y.,	1858	1861
Coppuck, Peter V.,	Mount Holly, N. J.,	1857	1869
Cressman, Noah,	Waterloo, Canada West,	1863	1864
Cunningham, James E.,	Pittsburg, Pa.,	1860	1863
Cushman, Alexander,	New York, N Y.,	1858	1861
Davies, Robert J.,	Brooklyn, N. Y.,	1858	1872
De Motte, Henry A.,	Jersey City, N. J.,	1871	1873
D'Evers, Henry Gaston,	Chicago, Ill.,	1865	1870
Dodge, John P.,	New York, N. Y.,	1855	1863
Easterbrook, Ray B.,	New York, N. Y.,	1858	1868
Ellis, Charles (Pres. 1857–58),	Philadelphia, Pa.,	1852	1873
Emanuel, Louis M.,	Linwood, Pa.,	1857	1868
Everson, John C.,	Philadelphia, Pa.,	1863	1872
Eyster, Christopher Edward,	Yankton, Dak.,	1871	1877
Fish, George B.,	Saratoga Springs, N. Y.,	1860	1866
Fish, Henry F.,	New York, N. Y.,	1852	1868
Forester, Richard,	Brooklyn, N. Y.,	1860	1862
Frohwein, Max,	New York, N. Y.,	1865	1877
Fulton, John Culpepper P.,	Brooklyn, N. Y.,	1873	1874
Gabaudan, Arthur W.,	New York, N. Y.,	1862	1870
Gaither, Francis S.,	Washington, D. C.,	1860	1876
Gay, William,	Cambridgeport, Mass.,	1858	1862
Geiger, Conrad J.,	Canton, O ,	1866	1876
Gerhard, John C.,	Cincinnati, O.,	1862	1866
Geyer, Andrew,	Boston, Mass.,	1853	1855
Goodwin, William W.,	Newburyport, Mass.,	1853	1877
Graefle, Frederick Alexander,	Baltimore, Md.,	1870	1873
Groneweg, Louis,	Cincinnati, O.,	1864	1866
Harbaugh, Valentine,	Washington, D. C.	1856	1871
Hassard, Peter J.,	Philadelphia, Pa.,	1853	1876
Hegeman, Frederick Augustus,	New York, N. Y.,	1855	1860
Hegeman, William,	New York, N. Y.,	1858	1875
Hensch, Hugo,	Cleveland, O.	1872	1873

		Elected.	Died.
Hendel, Samuel D.,	St. Louis, Mo.,	1858	1871
Hill, Henry E.,	Detroit, Mich.,	1866	1868
Hollis, Thomas,	Boston, Mass.,	1853	1875
Hommann, James W.,	New York, N. Y.,	1875	1875
Howard, George M.,	Washington, D. C.,	1871	1877
Hughes, Henry Arnold,	Louisville, Ky.,	1857	1876
Hunt, Henry H.,	Balston Spa, N. Y.,	1876	1877
Jardella, Jerome B.,	Vincennes, Ind.,	1865	1870
Jenkins, William Ellis,	Boston, Mass.,	1865	1869
John, Frederick L ,	Philadelphia, Pa.,	1856	1864
Johnston Charles P.,	Memphis, Tenn.,	1868	1873
Junghanns, Charles A.,	Cincinnati, O.,	1858	1862
Keffer, Frederick A ,	New Orleans, La.,	1862	1873
Kennedy, Robert C.,	Cleveland, O.,	1865	1868
Kent, Ashbury,	Cincinnati, O.,	1854	1860
Kent, William,	Cincinnati, O.,	1864	1867
Kidder, Darius B.,	Boston, Mass.,	1858	1874
King, Alexander,	Buffalo, N. Y.,	1874	1876
King, Henry,	New York, N. Y.,	1858	1867
Knapp, Edwin E.,	Norwalk, Conn.,	1860	1862
Laidley, Joseph,	Richmond, Va.,	1852	1861
Lancaster, Thomas A.,	Philadelphia, Pa.,	1859	1875
Lane, James B.,	Fitchburg, Mass.,	1856	1867
Leitch, Alexander,	St. Louis, Mo.,	1858	1868
Lineaweaver, Kline Cyrus,	Washington, D. C.,	1864	1873
Little, William B.,	Panama, U S. Colombia,	1857	1867
Longshaw, William, Jr.,	Bayou Sara, La.,	1858	1864
Lyon, Charles H., Jr.,	Boston, Mass.,	1858	1871
McBride, James,	St. Louis, Mo.,	1864	1871
McConville, Michael S.,	Worcester, Mass.,	1859	1873
McDonald, John,	Brooklyn, N. Y.,	1860	1861
McIntyre, Timothy C.,	Washington, D. C.,	1858	1862
McPherson, George B.,	Cincinnati, O.,	1867	1871
Mallinckrodt, Gustavus,	St. Louis, Mo.,	1869	1877
Massot, Eugene L.,	St. Louis, Mo ,	1857	1871
Matt, Joseph,	Columbus, O ,	1872	1874
Mattern, Jonathan C.,	Pittsburg, Pa.,	1860	1876
Maxwell, James T.,	New York, N. Y.,	1855	1860
Mayer, Ferdinand F.,	New York, N. Y.,	1859	1869
Mcakim, John (Pres. 1855-56),	New York, N. Y.,	1852	1863
Metcalf, Tristram W.,	Brooklyn, N. Y.,	1857	1873
Melzar, Augustus P.,	Wakefield, Mass.,	1856	1874
Milhau, John (Pres. 1867-68),	New York, N. Y.,	1855	1874
Muller, William H.,	Chicago, Ill.,	1865	1870
Nagle, John G.,	Baltimore, Md.,	1863	1869
Nairn, Joseph Wilson,	Washington, D. C.,	1858	1875
Nadand, James W.,	Cincinnati, O.,	1864	1868

		Elected.	Died.
Norgrave, Samuel K ,	Pittsburg, Pa.,	1857	1871
Olliffe, William J.,	New York, N. Y.,	1858	1866
O'Brien, Joseph C.,	Baltimore, Md.,	1863	1873
Osgood, Samuel W.,	Davenport, Iowa,	1858	1860
Palmer, Albert G.,	Washington, D.C.,	1858	1860
Parker, Herschel,	Brooklyn, N. Y.,	1867	1870
Parrish, Edward (Pres. 1868–69),	Philadelphia, Pa ,	1852	1872
Peck, Samuel P.,	Bennington, Vt.,	1853	1859
Pettis, Newton C.,	North Adams, Mass.,	1868	1874
Philbrick, Samuel R.,	Boston, Mass.,	1852	1859
Phillips, Llewellyn,	Baltimore, Md.,	1856	1865
Platzer, Robert,	Philadelphia, Pa.,	1865	1874
Polhemus, James L.,	Sacramento, Cal.,	1866	1867
Pollard, Charles P.,	Marysville, Cal.,	1859	1869
Porter, Henry C.,	Towanda, Pa.,	1869	1877
Procter, William, Jr. (Pres. 1862–63),	Philadelphia, Pa.,	1852	1874
Pyle, J. Lindley,	Brooklyn, N. Y.,	1859	1866
Rehfuss, Lewis,	Cincinnati, O.,	1854	1856
Reifsnider, William E.,	Baltimore, Md.,	1864	1872
Reinold, Bernard H.,	New York, N. Y.,	1861	1876
Roberts, David,	Boston, Mass.,	1858	1863
Rollmann, Frederick,	Philadelphia, Pa.,	1862	1864
Roemer, Daniel,	Cincinnati, O.,	1865	1870
Sands, Jesse M.,	New York, N. Y.,	1860	1867
Schmidt, Henry,	New York, N. Y.,	1874	1875
Schmidt, William George,	Louisville, Ky.,	1874	1877
Scott, John,	Cincinnati, O.,	1854	1873
Scully, Harmar D.,	Pittsburg, Pa.,	1858	1866
Smith, Charles Augustus,	Cincinnati, O.,	1852	1862
Smith, Edward A.,	Baltimore, Md.,	1870	1875
Smith, Edwin R.,	Monmouth, Ill.,	1862	1869
Smith, James W.,	Norfolk, Va.,	1873	1876
Smith, Samuel A.,	Newburyport, Mass.,	1859	1874
Squire, William H.,	Germantown, Pa.,	1862	1865
Steiner, Henry,	Philadelphia, Pa.,	1857	1858
Stevens, Ashbel Mead,	Cincinnati, O.,	1854	1860
Stevens, Rufus Walker,	Somersworth, N. H.,	1859	1868
Suding, Henry A.,	Baltimore, Md.,	1870	1875
Sweetser, Thomas Augustus,	South Danvers, Mass.,	1859	1860
Taylor, Robert J.,	Newport, R. I.,	1859	1871
Taylor, William,	Philadelphia, Pa.,	1868	1871
Thomas, William,	Jersey City, N. J.,	1855	1856
Tully, Andrew J.,	New York, N. Y.,	1862	1875
Uhl, Charles,	Memphis, Tenn.,	1860	1873
Waite, Samuel B.,	Washington, D. C..	1858	1862
Warren, Charles Henry,	Brandon, Vt.,	1872	1876
Warren, William,	Brighton, Mass.,	1867	1871

		Elected.	Died.
Watson, William J.,	Brooklyn, N. Y.,	1853	1872
Weyman, George W.,	Pittsburg, Pa.,	1858	1864
White, Daniel F.,	Charlestown, Mass.,	1859	1864
White, William P.,	Chicago, Ill.,	1865	1866
Whitehead, Silas,	Lynchburg, Va.,	1856	1858
Wilson, George C.,	Boston, Mass.,	1859	1861
Wiseman, Charles,	Baltimore, Md.,	1856	1862
Witzell, Louis,	Cincinnati, O.,	1864	1867
Wood, G. Davidge,	Baltimore, Md.,	1856	1863
Woods, Samuel H.,	Boston, Mass.,	1859	1869
Wright, George,	New York, N. Y.,	1869	1873

LIST OF RESIGNATIONS.

Names.	Residence.	Elected
¿Carpenter, George W.,	Philadelphia,	1873
¿Chamberlain, Humphrey B.,	Syracuse, N. Y.,	1874
‡Cook, William A.,	Washington, Iowa,	1871
†Evans, William, Jr.,	Philadelphia, Pa.,	1860
¿Ewing, William G.,	Nashville, Tenn.,	1872
‖Fischer, H. Emil,	Richmond, Va.,	1873
¿Heylman, Charles,	Chicago, Ill.,	1865
‡Hill, Hiram H.,	Cincinnati, Ohio,	1864
†Jefferson, Charles L.,	Philadelphia, Pa.,	1869
¿Kleinschmidt, August A.,	Memphis, Tenn.,	1873
†Mason, Frederick E.,	Philadelphia, Pa.,	1871
‡Masters, D. Edwards,	Springfield, Mass.,	1873
†Muchmore, William F.,	Basking Ridge, N. J.,	1868
†Neal, Leander,	Youngstown, O.,	1858
¿Peter, Arthur,	Louisville, Ky.,	1874
¿Phillips, Francis J.,	Providence, R. I.,	1875
†Porter, George G.,	New York,	1860
‖Rankin, Alfred J.,	Pittsburg, Pa.,	1864
¿Rau, Eugene A.,	Bethlehem, Pa.,	1870
¿Seltzer, Isaac M.,	New York,	1877
*Senior, Alfred,	Maxomanie, Wis.,	1869
*Senior, Alfred, Jr.,	Maxomanie, Wis.,	1874
†Shoemaker, George Y.,	Philadelphia,	1862
¿Steingoetter, Henry,	Belleville, Ill.,	1871

* Left the country.
† Left the business.
‡ Inability to attend the meetings.
¿ No reason given.
‖ Ill health.

LIST OF MEMBERS DROPPED FROM THE ROLL.

Name.	Residence.	Elected.
Ayers, James M.,	St. Louis, Mo.,	1872
Blake, Amos R.,	St. Louis, Mo.,	1871
Brown, Robert J.,	Leavenworth, Kan.,	1862
Bugge, Andrew V.,	New Orleans, La.,	1868
Burk, William B.,	Philadelphia,	1873
Burnham, George H.,	Hudson, Mass.,	1871
Burrough, Edward E.,	Baltimore, Md.,	1869
Cahill, John F.,	Cardenas, Cuba,	1870
Caldwell, J. Marshall,	Philadelphia,	1866
Caldwell, Joseph F.,	Pittsburg, Pa.,	1872
Cary, George H.,	Versailles, Ky.,	1866
Chase, Charles D.,	Denver, Col.,	1872
Cheney, Judson R.,	Del Norte, Col.,	1868
Connor, James F.,	St. Louis, Mo.,	1871
Curran Edward S.,	Fond du Lac., Wis.,	1869
Cutler, John N.,	Albany, N. Y.,	1870
Dale, Frank C.,	Logansport, Ind.,	1874
Dove, John E.,	Richmond, Va.,	1873
Duncan, Jefferson E.,	Boston, Mass.,	1871
Dyer, Joseph H.,	Boston, Mass.,	1865
Farrar, Samuel W.,	Richmond, Va.,	1873
Fortier, Zepherin,	Fitchburg, Mass.,	1875
Garver, Alexander,	Navarre, O.,	1866
Guzman, Horace,	Grenada, Nicaragua,	1871
Haight, William B.,	Stamford, Conn.,	1872
Hampson, Hugh H.,	Memphis, Tenn.,	1869
Hazard, Thomas H.,	Philadelphia,	1870
Hensel, Samuel P.,	Unknown,	1872
Hisner, Henry C. W.,	Fort Wayne, Ind.,	1874
Hill, Frank P.,	Elyria, O.,	1872
Hubley, Alfred A.,	Lancaster, Pa.,	1870
Ingalls, Albert O.,	Fort Scott, Kan.,	1869
Jackson, James M.,	Philadelphia,	1874
Jaques, Isaac W.,	Newark, N. J.,	1869
Jones, William H.,	Boston, Mass.,	1875
Kelley, Edward F.,	Pulaski, N. Y.,	1870
Kirsten, Adolph,	Jersey City, N. J.,	1867
Kuhles Philip,	New York,	1873
Lilly, James E.,	Evansville, Ind.,	1872

Name.	Residence.	Elected.
Littlefield, Chauncey B.,	Manchester, N. H.,	1868
McAlmont, John J.,	Little Rock, Ark.,	1871
McDonald, William,	North Adams, Mass.,	1873
Mellor, Godfrey K.,	Jersey City, N. J.,	1875
Noyes, Daniel N.,	Lee, Mass ,	1873
Parham, Robert,	Leavenworth, Kan.,	1868
Peck, Anley M.,	Mount Vernon, N. Y.,	1874
Perry, Edward H.,	Boston, Mass.,	1865
Pettit, Henry M.,	Leavenworth, Kan.,	1860
Roberts, John S.,	Columbus, O.,	1872
Safford, William A.,	Lowell, Mass.,	1865
Smith, Albert A.,	Unknown,	1869
Smith, William,	York, Pa.,	1873
Sorensen, Sophus,	Meadville, Pa.,	1872
Weeks, Eugene J.,	Jackson, Miss.,	1866
Wilson, Howard E.,	Springfield, Mass.,	1873

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